

## **NUTRITION INTEGRATED INTO PHYSICAL EDUCATION**

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## **THE PROBLEM**

Obesity is endemic in America and many factors contribute to this. Basically many children eat more calories than they burn. Obese children leading an inactive lifestyle and having poor eating habits have to deal with chronic health issues in their youth rather than later in life. Schools play a large part in a person's life and how they view their health and eating habits. Generally if a school environment is healthy students in that environment can express themselves in healthy ways. Schools are doing a disservice to students when there is an obvious problem of obesity and inactivity in this country and no one is addressing it. In most school districts today elementary children receive physical education classes twice per week for only thirty minutes each. Health education classes are rarely taught to children until middle school, after many eating patterns have been established.

## **A PARTIAL SOLUTION**

Physical Education has traditionally been a class where physical activity concepts are taught. Since the way a person feels and performs has to do with how they eat, it makes sense to teach nutrition concepts along with physical education. To be physically educated means to know how to take care of oneself in terms of fitness, but also in terms of disease prevention, and living a healthy lifestyle.

## **CONSTRAINTS AND PLANS**

The physical education curriculum is very full. The physical educator has a lot of content to teach in a very short period of time. The trick is to teach health and nutrition concepts without sacrificing the physical education content. Some health concepts will be taught through active games and activities that will also keep the kids moving. These activities will not always take the entire 30-minute gym period. They may be done during the warm up or cool down exercises. The point is to teach basic concepts to children so that they can use the information in their daily lives, not to teach every concept that a nutrition specialist may teach in a classroom setting.

Some concepts will be more difficult to teach in a physical game or activity. These concepts will be communicated to students and parents through a variety of modalities. One concept will be taught per month, and different aspects of that concept will be taught at different grade levels. The concept of the month will be posted on a bulletin board outside of the gym. The school newsletter will have articles written about the concept of the month, and web sight links will be given for those who wish to seek more information about the topic. The physical educator will have handouts outlining the concept of the month for students to take home and share with parents. Lastly, the physical educator can team up

with classroom teachers to teach concepts to students during technology time. There are many web sights designed for students to learn about nutrition in an interactive and meaningful way using computers.

## **WHAT IS IT THAT K-6<sup>TH</sup> GRADE STUDENTS SHOULD KNOW ABOUT HEALTH AND NUTRITON?**

### THE NINE NUTRITION CONCEPTS

1. The food groups and the food pyramid.
2. The six major classes of nutrients to keep the body healthy: water, carbohydrate, fats, proteins, vitamins, and minerals.
3. The right carbohydrates – “healthy carbohydrates”.
4. The right fats – not all fat is bad. Related topic: good vs. bad cholesterol.
5. What is a protein? Why do we need it?
6. Free radicals and antioxidants.
7. What is a calorie?
8. Portion sizes and how this relates to maintaining a healthy weight.
9. How to read a nutrition facts label.

Each concept is detailed in it’s own section below with more detail given about the content that will be taught. At the end of each concept there are web sights and other resources that the physical educator will use to teach the content of each concept. The highlights of the web sights will be given in that section of this paper.

### **CONCEPT #1: THE FOOD GROUPS AND THE FOOD PYRAMID**

- Eat a variety of “Grow Foods”. “Grow Foods” are whole foods – fruits, vegetables, legumes, whole grains, nuts, yogurt, eggs, healthy oils
- Grow Foods come from nature not the factory.
- Grow Foods can be equated with children because they equate growing with running fast, getting bigger, getting stronger, getting smarter.
- Grow Foods can be equated with “Traffic Light Eating”:
  - Green light foods = Go for it foods! Any time foods – fruits, vegetables, and all Grow Foods we find in nature.
  - Yellow light foods = Sometimes foods like sweet treats and desserts.

Red light foods = No time foods. The red light food says, "Stop!  
Can you make a healthier choice?"

### **CONCEPT #1: WEB SITES TO SUPPORT THIS CONCEPT**

[www.5aday.com](http://www.5aday.com)

- 5 A Day the color way.
- Nutrition education program.
- Eat more fruits and vegetables.
- "There is a rainbow on my plate."
- Teaches the importance of eating 5 or more servings of colorful nutrient rich fruits and vegetables every day.
- Colorful fruits and vegetables provide a wide range of vitamins, minerals, fiber, and phytochemicals your body uses to maintain good health and energy levels, protect against effects of aging, reduce the risk of cancer and heart disease.
- The colors are blue/purple, green, white, yellow/orange, red. The web sight gives lists of fruits and vegetables in these color areas.

[www.eatright.org](http://www.eatright.org)

This web site is excellent for all nine of the concepts.

- This web site is from the American Dietetic Association.
- This web site contains information about food and nutrition fact sheets:
  - A. Fats, oils, sweeteners
  - B. Kids nutrition needs
  - C. Vitamins, minerals, and functional foods
  - D. Weight management

[www.mypyramid.gov](http://www.mypyramid.gov)

- My pyramid tracker is an assessment of your food intake and physical activity level based on age and gender.
- My pyramid for kids helps kids to see how many servings they should be eating from each food group.
- Learn about the food groups and see how much physical activity you should be getting inside the pyramid.

[www.nutrition.gov](http://www.nutrition.gov)

- My pyramid for kids.
- Team Nutrition youth activities.
- Information about grains.

[www.smallstep.gov/kids/index.cfm](http://www.smallstep.gov/kids/index.cfm)

- On line Games and activities to help kids learn about healthy eating and physical activity.

[www.teamnutrition.usda.gov/kids-pyramid.html](http://www.teamnutrition.usda.gov/kids-pyramid.html)

- My pyramid for kids classroom materials.
- Lesson plans and teacher guides for the classroom.
- Pyramid poster.

Search Nutrition + Education + Curriculum = Food and Nutrition Information Center. Professional and Career.

- My pyramid lesson plans and handouts for teaching my pyramid for pre K through 8<sup>th</sup> grade.
- My pyramid handouts for grade level.
- Nutrition display.

Search Nutrition + Physical + Education =

[www.cloudnet.com/~edrbsass/edpe.htm#nutrition](http://www.cloudnet.com/~edrbsass/edpe.htm#nutrition)

- Nutrition lesson plans.

## **CONCEPT #2: SIX MAJOR CLASSES OF NUTRIENTS TO KEEP THE BODY HEALTHY**

1. Water
2. Carbohydrates – “Go Foods”
3. Fats – Concentrated “Go Foods”
4. Proteins – “Grow Foods”
5. Vitamins – “Glow Foods”
6. Minerals – “Glow Foods”

### **1. WATER**

- Water is the most essential nutrient. Water is the medium in which all the body's processes take place.
- Sixty percent of the body weight is water that carries materials to and from cells and provides a warm nutrient-rich bath in which cells thrive. Without water a person could not live more than a few days.

2. CARBOHYDRATES (More information about #2, #3, and #4 in their own concept sections later in the paper.)

3. FATS

4. PROTEINS

- Energy yielding nutrients: Carbohydrates, Protein, and Fat. Body uses these to fuel its activities.

## 5. VITAMINS

- Essential versus non-essential nutrients.
- Essential = compounds that the body cannot make for itself but are indispensable to the life process. It must be obtained through foods.
- Vitamins, minerals, and water once broken down in the body do not yield energy. They perform the tasks of maintenance and repair. Vitamins and minerals do not supply energy or calories. They regulate the release of energy and other aspects of metabolism.
- Table 6-1 A Guide to Vitamins (p.168 Boyle) gives best sources of vitamins, roles, deficiency symptoms, and toxicity symptoms.
- Vitamins are compounds that perform bodily functions that promote growth and reproduction and maintain health. They are macronutrients a person must get from food because the body can't make them from scratch.
- Vitamins are divided into 2 classes:

### A. Water Soluble – dissolve in water = 8 B Vitamins and Vitamin C

- The role of the water soluble B vitamins is to help enzymes release energy from carbohydrate. B vitamins are involved in fat metabolism, formation of antibodies and red blood cells, maintains nerve cells, red blood cell formation, and energy metabolism.
- People get B vitamins from eating meat, pork, liver, fish, poultry, shellfish, whole grain foods, nuts, legumes, seeds, milk, yogurt, cheese, leafy green vegetables, eggs, soy products, and citrus fruits.
- The role of the water soluble C vitamin is synthesis of collagen, which helps heal wounds, maintain bone and teeth, and strengthen blood vessel walls. Vitamin C is also an antioxidant that strengthens the resistance to infection. It also helps the body absorb iron.
- People get vitamin C from eating citrus fruits and juices, berries, green and red peppers, tomatoes, broccoli, and spinach.

### B. Fat Soluble – dissolve in fat and store in the liver and body fat = A, D, E, and K. It is possible to build up toxic levels in the body.

- Fat Soluble Vitamins = Vitamin A in the form of Retinol is found in fortified milk, margarine, cream, cheese, butter, eggs, and liver.
- Vitamin A in the form of Beta-Carotene is found in spinach and other dark leafy greens, broccoli, deep orange fruits (apricots, peaches, cantaloupe), vegetables (squash, carrots, sweet potatoes, and pumpkin).
- The role of Vitamin A is vision, growth and repair of body tissues; maintain mucous membranes, reproduction, bone and tooth formation, immunity, and hormone synthesis.

- Fat Soluable Vitamins = Vitamin D comes from self-synthesis with sunlight, fortified milk, fortified margarine, eggs, liver, and fish.
- The role of Vitamin D is calcium and phosphorus metabolism (bone and tooth formation), aids in body's absorption of calcium.
- Fat Soluable Vitamins = Vitamin E comes from vegetable oils, green leafy vegetables, wheat germ, whole grain products, liver, egg yolk, salad dressings, mayonnaise, margarine, nuts, and seeds.
- The role of Vitamin E is that it protects red blood cells, it is an antioxidant that protects fat soluble vitamins, and it stabilizes cell membranes.
- Fat Soluable Vitamins = Vitamin K comes from the bacterial synthesis in the digestive tract, liver, green leafy and cabbage type vegetables, soy beans, milk, and vegetable oils.
- The role of Vitamin K is the synthesis of blood clotting proteins that regulate blood calcium.

## 6. MINERALS

- The Major Minerals are: Calcium, Chloride, Magnesium, Phosphorus, Potassium, Sodium, and Sulfur. (Boyle pp. 208-209 Table 7-2 is a Guide to the Minerals.)
- The Trace Minerals are: Chromium, Copper, Fluoride, Iodine, Iron, Manganese, Molybdenum, Selenium, and Zinc.
- Minerals do not contribute energy (calories) to the diet. The body requires only a small amount of minerals. Each major food group supplies many of the minerals. Too much or too little of minerals in the diet can have dire circumstances including death.

### **CONCEPT #2: WEB SITES AND SOURCES TO SUPPORT CONCEPT**

Search Nutrition + Education + Curriculum = Food and Nutrition Information Center. Professional and Career.

- From Utah State Board of Education.
- Food and fitness nutrition and food curriculum guide lesson plans.
- Food that keeps the body fit.
- Essential nutrients, and daily guides for the six basic nutrients.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (pp. 34-35, p. 168, pp. 208-209). Belmont, CA: Wadsworth/Thomson Learning publishing

### **CONCEPT #3: THE RIGHT CARBOHYDRATES – “HEALTHY CARBS”**

- Fifty percent of a child's diet should be carbohydrates. Even more if they are active.
- “Good” carbs are packed by nature – fruits, vegetables, legumes, whole grains, and fiber rich foods.

- “Bad” carbs come from the factory.
- The worst carbs are sweetened beverages because they are absorbed into the blood stream quickly.
- Simple carbohydrates include naturally occurring sugars in fresh fruits and some vegetables and in milk and milk products and added sugars in concentrated form, honey, corn syrup, or sugar in the sugar bowl. (Boyle, p. 70)
- If any of the following sugars appears in the 1<sup>st</sup> or 2<sup>nd</sup> in the ingredients list, or if several sugar names are listed, the food is likely to be high in sugar. Other names of sugar: brown sugar, corn sweeteners, corn syrup, dextrose, fructose, fruit juice concentrate, glucose, high fructose corn syrup, honey, invert sugar, lactose, malt syrup, molasses, raw sugar, sucrose, sugar, and syrup. (Boyle, p. 74)
- The Savvy Diner “Why Whole-grain Foods?” – they contain vitamins, minerals, fiber, and other protective substances that contribute to the health benefits. (Boyle, p. 79)
- Most nutritional guidelines tend to favor a more whole-food plant based diet. The more a food resembles the original farm-grown product, the more nutritious it is likely to be. During processing some nutrients may be lost and often nutrient-poor additions like sugar, salt, and fat are made. Potato versus a French fry versus potato chips is a good example of this. (Boyle, p. 81)
- Foods containing complex carbohydrates are usually lower in calories per portion than protein-rich foods because protein foods often include much more fat. (Boyle, p. 81)
- Fiber comes from plants and the supporting structures of the plant’s leaves, stems, and seeds. (Boyle, p. 83)
- Foods such as potatoes, dried beans and peas, rice and whole-grain bread, cereals and pastas are especially nutritious because of their starch fiber, vitamin and mineral content – and because they are almost fat and cholesterol free. (Boyle, p. 83)

### **CONTENT #3: WEB SITES AND OTHER SOURCES TO SUPPORT CONCEPT**

[www.5aday.com](http://www.5aday.com)

- Five a day the color way.
- “There’s a rainbow on my plate.”

[www.dole5aday.com/teachers/classroomresources/instructional/T\\_healthysnack.jsp](http://www.dole5aday.com/teachers/classroomresources/instructional/T_healthysnack.jsp)

- Lesson plans for nutrition.
- Five a day activity sheets for parents.
- “How’d you do your 5 today?” chart.

[www.dole5aday.com/kids/K\\_index.jsp](http://www.dole5aday.com/kids/K_index.jsp)

- Internet site for kids.
- Internet games.
- Five a day facts.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (p. 70, p. 74, p. 79, p. 81, p. 83). Belmont, CA: Wadsworth/Thomson Learning publishing

**CONCEPT #4: THE RIGHT FATS – NOT ALL FAT IS BAD**  
**RELATED TOPIC: GOOD VERSUS BAD CHOLESTEROL**

- Need the “right” fat in the diet. Using the right fat in the diet is not necessarily a low fat diet.
- Omega-3 fats are found in seafood, especially wild salmon. It is also found in flax oil and olive oil.
- Healthy fats are also found in nuts and nut butters, seeds such as sesame seeds and sunflower seeds, and avocados.
- The less healthy fat comes from animal fats, which are saturated fats.
- The worst fat of all are Hydrogenated fats and oils. These fats come from the factory. They have been processed and chemically changed to make the foods last longer and cannot be metabolized in the body.
- Hydrogenated fats are very bad for the health. This oil is processed by adding hydrogen to unsaturated fat to prevent spoilage in foods to make them last longer.
- Boyle p. 112 has a list of foods that are hydrogenated.
- Boyle p. 106 figure 4-2 is a chart on oils and saturation.
- Boyle p. 119 figure 4-10 has a list of major sources of Trans Fatty Acids in the U.S. diet.
- What kinds of fats should you eat? Monounsaturated fats because they do not raise blood cholesterol levels nor react to oxygen, which leads to plaque build-up on artery walls.

Functions of Fat in the body:

- Concentrated source of energy.
- Energy reserve.
- Form major components of cell membranes.
- Nourish skin and hair.
- Insulate body from extremes of temperature.
- Cushion vital organs to protect from shock.

Functions of Fat in Food:

- Provides 9 calories per gram.
- Provide satiety – feeling full.
- Carry fat soluble vitamins (A, D, E, K) and essential fatty acids to where they belong in the body.

- Contribute to aroma and flavor of food.

### Types of Fatty Acids:

#### A. Saturated Fatty Acids

- Animal foods, full fat dairy products, tropical oils (palm, coconut).

#### B. Unsaturated Fatty Acids

- Animal and plant foods.
- Examples are avocados, cashews, peanut butter, peanuts, and poultry.
- There are two types of Unsaturated Fatty Acids:
  - a. Monounsaturated Fatty Acid
    - Examples of these are vegetable oils (olive, canola, peanut).
  - b. Polyunsaturated Fatty Acid
    - Examples of these are fish, nuts (almonds and pecans), vegetable oils (safflower, sunflower, corn oil, cotton seed oil, sesame oil, and soybean), liquid/soft margarine, and mayonnaise.

Essential Fatty Acids – must eat them to get them.

- Omega 6 and Omega 3 are the essential fatty acids. These help protect health and are available in plant and fish oils.
- When a person eats Omega 6 and Omega 3 essential fatty acids they have a low rate of heart disease, they have lower blood cholesterol and triglycerides, and their blood is slower to clot. They also have decreased cancer rates, and reduced inflammation in arthritis and asthma.

### **SUB TOPIC: GOOD VERSUS BAD CHOLESTEROL**

- Cholesterol is a silent, symptom less risk factor for heart disease.
- High blood cholesterol is also due to lifestyle reasons as well as inherited tendencies to make too much or fail to destroy it on schedule. Eating too much fat or saturated fat, exercising too little, or carrying too much weight can cause high cholesterol.
- The underlying cause of heart disease is atherosclerosis, which is narrowing of the arteries caused by a build up of cholesterol-containing plaque in the arterial walls.
- How does a person lower the bad LDL cholesterol? They can substitute the highly monounsaturated fats (canola and olive oil) and highly polyunsaturated fats (vegetable and fish oils) for saturated fats.
- Health experts advise that a person decrease consumption of foods rich in Omega 6 fatty acids such as vegetable oils (corn, safflower, sesame, sunflower) and increase the intake of Omega 3 fatty acids found in fish, canola oil, flaxseed, and soy foods.
- Boyle p. 117 Table 4-6 shows sources of Omega 3 fats in the diet.

## CONCEPT #4: WEB SITES AND SOURCES TO SUPPORT CONCEPT

<http://vmcfsan.fda.gov/~dms/dfats.html>

- Information on fats and fatty acids, cholesterol, triglycerides, and dietary fat and cholesterol levels.
- How do we know fat is a problem?
- Fat words.

[www.eatright.org](http://www.eatright.org)

- Information about fats, oils, and sweeteners.
- Information about weight management.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (pp. 110-112, p. 117). Belmont, CA: Wadsworth/Thomson Learning publishing

## CONCEPT #5: WHAT IS A PROTEIN AND WHY DO WE NEED IT?

Functions of proteins

1. Growth and maintenance – build all living tissue.
  2. Enzymes – all enzymes are proteins. They facilitate chemical reactions in the body.
  3. Hormones – regulate body processes.
  4. Antibodies – maintains body's resistance to disease. Provides immunity.
  5. Fluid Balance – regulates quantity of fluids in the body.
  6. Acid-Base Balance – to maintain normal concentrations.
  7. Transportation – move nutrients and other substances into and out of cells and around the body.
  8. Body Structure – vital parts of the body structures (skin, nails, hair, membranes, muscles, teeth, bones, organs, ligaments, tendons).
  9. Energy – used to provide calories. Protein is four calories per gram. Protein is only used for energy if not enough carbohydrates or fats are ingested.
- Complete proteins come from animals.
  - Complementary proteins are plant proteins that can be consumed together to make a complete protein.
  - Examples of complementary proteins are:
    - red beans + rice
    - peanut butter + bread
    - rice + lentils
    - garbanzo beans (hummus) + sesame seeds
    - tofu + broccoli + almonds
    - Spinach salad + pine nuts + kidney beans
    - rice + black-eyed peas
    - barley+ lentil soup
    - corn tortilla + beans

## CONCEPT #5: WEB SITES AND SOURCES THAT SUPPORT CONCEPT

[www.hsph.harvard.edu/](http://www.hsph.harvard.edu/)

- Protein information having to do with complete and complimentary proteins.
- Protein and the immune system.
- Protein and weight control.
- Information on soy protein.
- Protein intake recommendations.

[www.kidshealth.org/kid/nutrition/food/protein.html](http://www.kidshealth.org/kid/nutrition/food/protein.html)

- Learn about proteins using the information in this web sight.
- Many foods contain protein, but which kind do you need to grow properly and stay healthy?
- This is a great web sight for kids to learn about proteins in a “kid friendly” way.
- All about Amino Acids.
- Different kinds of proteins.
- How much protein is enough?

[www.RevolutionHealth.com](http://www.RevolutionHealth.com)

- Use this web site to learn about nutrition, access to articles, blogs, and forums.
- The hidden promise of Protein.
- Understand the link between protein and hunger.
- Score! What to feed kids in team sports.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (pp. 137-140). Belmont, CA: Wadsworth/Thomson Learning publishing

## CONCEPT #6: FREE RADICALS AND ANTIOXIDANTS

- Free radicals are highly toxic compounds created in the body as a result of chemical reactions that involve oxygen. They are environmental pollutants such as cigarette smoke and ozone also prompts the formation of free radicals in the body. (Boyle, p. 111)
- Free radicals are chemical compounds that oxidize LDL (bad cholesterol) and they become a problem when there are too many of them. (Boyle, p. 111-112)
- Left unchecked free radical compounds can cause severe cell injury and ultimately may contribute to the development of chronic diseases such as cancer and heart disease. (Boyle, p. 177)

- Antioxidants (beta carotene, vitamins C and E and the mineral selenium) act to strengthen the body's natural defenses against cell damage by blocking the potentially damaging free radicals that arise as part of numerous normal cell activities. Antioxidants help to prevent damage done to the body as a result of chemical reactions that involve the use of oxygen. (Boyle, p. 111)
- The antioxidants prevent free radicals from attacking cells and causing damage by neutralizing the free radicals and converting them back into stable oxygen molecules. (Boyle, p. 178, Figure 6-3)
- Table 6-8 Vitamin C in foods. (Boyle, p. 177)
- Table 6-9 Vitamin A in foods. Beta-carotene is an orange plant pigment that is a Vitamin A precursor. Almost all brightly colored hues of green, yellow, orange, and red are beta-carotene. (Boyle, p. 180)
- Table 6-11 Vitamin E in foods. (Boyle, p. 182)
- Figure 6-3 (Boyle, p. 178) is a figure that represents the relationship between free radicals and antioxidants.
- Phytochemicals and physiologically active compounds found in plants that appear to help promote health and reduce the risk for cancer, heart disease, and other conditions. (Boyle, p. 115)
- Phytochemicals are nonnutritive substances in plants that possess health-protective benefits. Phytochemicals are the compounds that give plants their brilliant colors. These are plant chemicals that may affect health and prevent disease. Phytochemicals are in edible plants, fruits and vegetables, grains, legumes, herbs and seeds.
- The naturally occurring phytochemicals are not vitamins, minerals, or nutrients. They do not provide energy or building materials. Phytochemicals might perform important functions by acting as powerful antioxidants, decreasing blood pressure and cholesterol, preventing cataracts, reducing menopause symptoms, and preventing osteoporosis.
- Research is going on in their roles for blocking some cancers. Phytochemicals may have the potential to slow the aging process, boost immune function, prevent, slow or even reverse certain cancers, and strengthen our hearts and circulatory systems. (Boyle, p. 191)
- Consume 5-9 servings of a variety of fruits and vegetables each day. Be sure to include deep green and brightly colored fruits and vegetables every day. By doing so a person's ability to repair free radical damage in the body is likely to be enhanced by the phytochemicals they contain. (Boyle, p. 373)

#### **CONCEPT #6: WEB SITES AND SOURCES TO SUPPORT CONCEPT**

[www.cosmeticcop.com/learn/article.asp?PAGETYPE:ART&REFER:SKIN&ID=13](http://www.cosmeticcop.com/learn/article.asp?PAGETYPE:ART&REFER:SKIN&ID=13)

- This is an article about what free radicals are and what antioxidants do.
- There is a great illustration of Antioxidants doing their job against free radicals for a human cell.

[www.rice.edu/~jenky/sports/antiox.html](http://www.rice.edu/~jenky/sports/antiox.html)

- Very good description of antioxidants and free radicals, and what vitamins make up the antioxidants.
- Preventing cancer and heart disease – do antioxidants help?
- Exercise and oxidative damage.
- Can antioxidant supplements prevent exercise induced damage or enhance recovery from exercise?
- Performance and antioxidants.
- How much is enough?
- Recommendations of antioxidant use.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (pp. 111-112, p. 115, pp. 177-178, p. 180, p. 182, p. 191, p. 373). Belmont, CA: Wadsworth/Thomson Learning publishing

### **CONCEPT #7: WHAT IS A CALORIE?**

- The body uses energy from carbohydrates, fat, and protein to do work or generate heat. This heat is measured in calories. (Boyle, p. 35)
- If a person's body does not "release" the energy they obtained from food soon after they have eaten it the energy is stored in the body as body fat for later use.
- If excess amounts of protein, fat, or carbohydrate are eaten regularly the stored fat builds up over time and leads to obesity.
- Body Mass Index (BMI) is an index of weight related to height.
- The body is always in a balancing act between calories in and calories out (burned).

### **CONCEPT #7: WEB SITES AND SOURCES TO SUPPORT CONCEPT**

Nutrition + Education + Curriculum = Food and Nutrition Information Center.  
Professional and Career.

- Nutrition across the curriculum nutrition lesson plans for pre K-12. From Louisiana Department of Education.

<http://health.discovery.com/tools/calculators/basal/basal.html>

- Input height and weight to determine your basal metabolism.
- This web site helps people to find their Basal Metabolic rate. This helps them to know how many calories they burn in one day.
- It also helps people to calculate their Body Mass Index.

<http://www.mypyramid.gov/>

- Input age, gender, and activity level to determine a person's daily calorie needs. It will break the calorie needs into ounces of grains, meat and beans; cups of vegetables, fruits, and milk; and teaspoons of oil. It will also suggest limiting the "extras" such as fats and sugars to a certain amount of calories per day.

<http://huhs.harvard.edu/HealthInformation/RiskAssessmentBMICalculator.htm>

- This is another web site that helps people assess their Basal Metabolism Index.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (p. 35). Belmont, CA: Wadsworth/Thomson Learning publishing

### **CONCEPT #8: PORTION SIZES**

- Grazing is healthier than a few larger meals. Grazing means eating small, frequent, mini-meals throughout the day rather than large meals.
- Studies have shown that people tend to put on less extra body fat when they break their meals up into 5-6 mini-meals instead of 3 big meals.
- Table 2-5 (Boyle, p. 46) "Are You Savvy about Serving Sizes?" is an excellent table to show what is in a serving.
- (Boyle, p. 48) "Rule of Thumb for portion sizes: It's all in your hands" is an excellent table to show how your hand can measure portion sizes.

### **CONCEPT #8: WEB SITES AND SOURCES TO SUPPORT CONCEPT**

<http://hp2010.nhlbihin.net/portion/>

- This web sight is from the Department of Health and Human Services National Institutes of Health – National Heart Lung and Blood Institute.
- Portion distortion! Do you know how food portions have changed?
- Learn about the difference between portions and servings.
- This web sight has links to slide shows about Portion Distortion and Keeping an Eye on Portion Size to learn the difference between portions and servings.

[www.RevolutionHealth.com](http://www.RevolutionHealth.com)

- Portions: Visualize protein servings with these tips.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (p. 46, p. 48). Belmont, CA: Wadsworth/Thomson Learning publishing

## CONCEPT #9: HOW TO READ A NUTRITION FACTS LABEL

- A consumer can use the food label to make informed choices for healthy eating. The food label allows a person to compare similar products, determine the nutritional value of the foods they choose, increase awareness of the links between good nutrition and reduced risk of chronic diet-related diseases.
- Start at the top of the nutrition fact label. Here there is serving size, number of servings per container, and calorie information.
- Limit these nutrients: total fat, saturated fat, cholesterol, and sodium.
- Get enough of these nutrients: dietary fiber, vitamin A, vitamin C, Calcium, and Iron. Look for foods that provide 10% or more of the minerals Calcium and Iron.
- The food label will list the % value based on a 2,000-calorie diet.
  - 5% or less of an item = low
  - 10% or more of an item = good
  - 20% or more of an item = high
- Reference values allow comparison of some values for nutrients in a serving of the food with the needs of a person requiring 2,000 or 2,500 calories per day.
- The ingredient lists items in descending order by weight. In other words, the first ingredient makes up the largest portion of all the ingredients.

## CONCEPT #9: WEB SITES AND SOURCES TO SUPPORT CONCEPT

[www.ag.uiuc.edu/~food-lab/nat](http://www.ag.uiuc.edu/~food-lab/nat)

- A free diet analysis program developed at the University of Illinois allows anyone to analyze the foods they eat for various nutrients.

[www.cfsan.gov/~dms/foodlab.html](http://www.cfsan.gov/~dms/foodlab.html)

- Information about how to read the nutrition facts label but no activities.

[www.mypyramid.gov](http://www.mypyramid.gov)

[www.nal.usda.gov/fnic/foodcomp](http://www.nal.usda.gov/fnic/foodcomp)

- Click on Search the Database for free food analysis. Just type in the food you want to analyze, and get a break down of its calories, fat, fiber, protein, vitamins, and minerals.

[www.nutrition.gov](http://www.nutrition.gov)

- Nutrition facts label and how to read it.
- Nutrient database.

[www.teamnutrition.usda.gov/kids-pyramid.html](http://www.teamnutrition.usda.gov/kids-pyramid.html)

- My Pyramid for kids.
- My Pyramid for kids classroom materials.
- My Pyramid for kids lesson plans and teacher guides.
- Food Pyramid poster.
- The lessons are not in a physical setting, it is a classroom setting.

[www.usda.gov/cnpp](http://www.usda.gov/cnpp)

- The interactive Healthy Eating Index – the USDA Center for Nutrition and Policy and Promotions online dietary assessment tool.
- After providing a day's worth of dietary information a person will receive a "score" on the overall quality of your diet compared to the Food Guide Pyramid and recommendations for total fat, saturated fat, cholesterol, and sodium.

Boyle, M. A., & Anderson, S. L. (2004). Personal Nutrition (pp. 50-51). Belmont, CA: Wadsworth/Thomson Learning publishing

### **OTHER SOURCES THAT SUPPORT ALL THE ABOVE CONCEPTS**

The following sources are general enough to support all of the nine concepts listed above.

[www.cdc.gov/nccdphp/dnpa](http://www.cdc.gov/nccdphp/dnpa)

- This web site is from the Centers for Disease Control and Prevention Nutrition and Physical Activity.
- This web site has nutrition information for everyone.
- It has resources for health professionals.
- It has healthy youth nutrition topics.
- It has information on physical activity, overweight and obesity, and has lots of statistical health information.

[www.healthierus.gov](http://www.healthierus.gov)

- This is a great resource for basic information that would tie-in to any of the concepts.
- It has information about nutrition, nutrition having to do with physical activity, diabetes, blood pressure, cholesterol, and obesity.

[www.nutritionexplorations.org](http://www.nutritionexplorations.org)

- This web site has nutrition lesson plans at different grade levels.
- This site might help a teacher decide what types of nutrition content to teach at different grade levels.

### **FUTURE HEALTH TOPICS**

In the future as health becomes more integrated into the physical education setting other topics may be introduced. Below is a list of web site sources that may support the content being taught.

[www.americanheart.org](http://www.americanheart.org)

- This web site is from the American Heart Association.
- It has a lot of information about children's health related to the heart.
- It has worksheets to learn about the heart by grade level.
- It discusses children's exercise and nutrition resources.
- Other content areas include cardiac disease in children, cholesterol in children, dietary guidelines for children, fiber, high blood pressure in children, and overweight in children.

[www.cardio.com](http://www.cardio.com)

- This web site is from the Cardiovascular Institute of the South
- The content includes the anatomy of the heart, heart disease and prevention, diet, nutrition, obesity, and smoking cessation.

[www.diabetes.org/professional.htm](http://www.diabetes.org/professional.htm)

- This web site is from the American Diabetes Association.
- It has information about diabetes, and prevention of the disease.
- It also has information about weight loss and exercise, information for parents and kids as well as health professionals and scientists.

### **SUMMARY**

Many challenges exist to integrate nutrition and health information into the physical education setting. The purpose is to not teach the entire health education curriculum. It would be impossible to do so as there is much to teach in the elementary physical education curriculum with limited time resources. The point is to integrate nutrition information into the physical education setting, as best as possible, one concept per month as the information deems appropriate during the weekly lesson. The purpose is to touch on basic concepts and principles so that children can use the information in their daily lives. The purpose is to also inform parents of the concepts learned at school so that small

changes may be made in the home. Over time, it is hoped that these concepts may help children choose health that may make big differences in their lives. Doing this during physical education makes sense because the physical education class is all about learning how to take care of oneself, and learning how to live a healthy balanced lifestyle.