READY, SET, LEARN: PORTAGE COUNTY 3rd GRADE NUTRITION EDUCATION CURRICULUM

A thesis submitted to the Kent State University Honors College in partial fulfillment of the requirements for Departmental Honors

by

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CHAPTER I

INTRODUCTION

According to the International Obesity Taskforce, over 155 million children worldwide are considered overweight and obese (IOTF, 2010). In the U.S. alone, more than 12 million children and adolescents are obese as reported by the Trust for America’s Health and the Robert Wood Johnson Foundation (F as in fat, 2010). In close relation to overweight and obesity statistics, diabetes is becoming a common chronic disease for children and adolescents with approximately 151,000 new diagnoses in 2010 (CDC, 2010).

Though the Dietary Guidelines for Americans, 2005 recommends that children over the age of two get at least 60 minutes of moderate to vigorous physical activity, preferably all days of the week, a study has shown that some school physical education classes offered third graders only 25 minutes of vigorous activity each week (Overweight and obesity, 2009). Research has demonstrated that only 2% of school aged children meet the serving recommendations for the five major food groups (Clark & Fox, 2009). This data supports the national survey data demonstrating that some children do not consume an adequate amount of vitamins and minerals needed to maintain health and support growth and development (Moshfegh, Goldman, & Cleveland, 2005). While the American Dietetic Association encourages children to achieve optimal physical and cognitive
development, attain a healthy body weight, and reduce the risk of chronic disease through appropriate eating habits and engaging in regular physical activity, the U.S. Department of Agriculture recognizes that there is still much concern for the nutrient intakes of children (Moshfegh, Goldman, & Cleveland, 2005).

As children continue to grow in a world fueled by various factors that affect their dietary intake, they lack nutritional knowledge and begin to assume that unhealthy eating behaviors are the norm. The continuance of such behaviors leads children to face the same chronic diseases and health issues that overweight and obese adults face (Overweight and obesity, 2009). In 2004, the Centers for Disease Control and Prevention researchers reported that poor diet and physical inactivity accounted for more than 365,000 U.S. deaths in 2000 (Foody, 2005). If sedentary behaviors are followed by unhealthy eating and a deficit in nutritional knowledge continues it can be predicted that today’s children will keep facing an obesity epidemic and its health-related consequences (Overweight and obesity, 2009).

With the daily participation of over 40 million children in the School Breakfast Program and National School Lunch Program, schools have the ability to promote the consumption of nutritious foods and teach the importance of physical activity (Clark & Fox, 2009). Many students that receive free and reduced price meals are from households with very low income and the meals provided by the school accounts for a significant amount of total calories that they will consume daily (Council of State Governments, 2011).
STATEMENT OF THE PROBLEM

Though the state of Ohio requires that health education (focusing on the nutritive value of foods, the relation of nutrition to health, and the use and effects of food additives) be incorporated into school curriculum, there have been financial and time restraints on nutrition education across all grade levels because of the intense pressure for schools to raise standardized testing scores (State school healthy policy database: health education, 2008).

A proposed solution to these problems is the Ohio Senate Bill 210 (SB 210), also known as the Healthy Choices for Healthy Children Act. SB 210 became law in July 2010 with the goal of decreasing the prevalence of childhood obesity through physical activity and an adequate intake of nutritious foods at school (ODE, 2011). BMI measurements for kindergarten, third, fifth, and ninth grade students are now mandatory in all school districts, community, STEM, and chartered non-public schools (ODE, 2010). Parents are informed of their child’s weight status via report cards that are sent home. The Department of Education has implemented a pilot program requiring students to engage in at least 30 minutes of moderate to vigorous physical activity each school day (ODE, 2010). Teachers must educate students about the benefits of physical activity and proper nutrition as one-half of the health education core curriculum, but an underlying issue remains that most teachers may lack the background knowledge on whether to decide what information is important or accurate.
Incorporating a nutrition education curriculum into the classroom will allow children to learn more through hands-on experiences and teachers will not have the task of creating specific lesson plans or conducting research on nutrition curricula that will be effective for students.

PURPOSE STATEMENT

The purpose of this project was to develop third grade nutrition education curriculum, and to evaluate the effectiveness of this nutrition curriculum on the knowledge of third grade students.

HYPOTHESES

H₁ – The 3rd grade students will have an increase in knowledge about nutrition and a change in their dietary behaviors at the completion of the nutrition education curriculum program.

H₀ – The 3rd grade students will not have an increase in knowledge about nutrition nor a change in their dietary behaviors at the completion of the nutrition education curriculum program.
CHAPTER II

REVIEW OF LITERATURE

RECOMMENDED DIETARY INTAKES OF CHILDREN

Dietary Reference Intakes for Children and Adolescents

Under the supervision of the Food and Nutrition Board working in conjunction with the Canadian Institute of Nutrition and Health Canada, the Dietary Reference Intakes were developed. The Dietary Reference Intakes (DRIs) are defined as “reference values that are the quantitative estimates of nutrient intakes to be used for planning and assessing diets for apparently healthy people” (Lee & Neiman, 2007). Since its first release in 1997, the DRIs have covered the nutritional recommendations of vitamins, elements, electrolytes, water, and macronutrients based on age (life stage) and gender. The DRIs are divided into four subgroups: Estimated Average Requirement (EAR), Recommended Dietary Allowance (RDA), Adequate Intake (AI), and Tolerable Upper Intake Level (UL).

The daily dietary nutrient intake level that is estimated to meet the nutrient requirement of 50% of healthy individuals in a particular life stage or gender group is the EAR (Lee & Neiman, 2007). Nutrient requirements set by the EAR differ for each individual due to variations in nutrient absorption and metabolism. The EAR serves as a
basis for setting the RDA, this is the average dietary intake level that is sufficient to meet the nutrient requirement of nearly all healthy individuals in a particular life stage of gender group. The RDA is set based on solid experimental evidence and reliable observations (Sizer & Whitney, 2006). If an EAR cannot be established, RDA cannot be set; therefore, a value based on experimentally determined approximations of nutrient information by a group(s) of healthy individuals is used instead (Sizer & Whitney, 2006). This separate reference intake is the AI and because it is set using presumably healthy groups of individuals, it is expected to meet or exceed the actual nutrient requirement of an individual. Unlike the EAR and RDA, the AI is used when data is lacking and indicates the need for additional research on specific nutrient requirements. Just as levels are established for nutrient intake, the UL establishes the highest level of daily nutrient intake that can be tolerated by the body without posing any adverse health effects (Sizer & Whitney, 2006).

The UL for many nutrients have yet to be established. Although there is no set recommendation for these nutrients, this does not imply that a high intake poses no risk. The components of the DRI s are based upon an individual’s increased or decreased nutrient needs and may need to be adjusted by a registered dietitian or qualified health professional depending on the requirement situation.

**Dietary Guidelines for Americans**

The purpose of the *Dietary Guidelines for Americans* is to “summarize and synthesize knowledge regarding individual nutrients and food components into
recommendations for an overall pattern of eating for the general public” (USDA & USDHHS, 2005, pg. vi). In 1980, a U.S. Senate Committee report prompted the Departments of Agriculture and Health, Education, and Welfare (now Health and Human Services) to release the first edition of the *Dietary Guidelines for Americans* (USDA & USDHHS, 2005). Every five years an updated version of the *Dietary Guidelines for Americans* is released by law (Public Law 101-445, Title III, 7 U.S.C. 5301 et seq.), providing professional advice about the health benefits of good dietary habits and participation in physical activity (USDA & USDHHS, 2010). Serving as the basis for federal food and nutrition education programs, such as the National School Lunch Program and the School Breakfast Program, the guidelines are designed for people ages two years and above, and can be accessed by the general public.

The *Dietary Guidelines for Americans, 2010*, addresses topics such as weight management through physical activity, foods and food components to reduce, foods and nutrients to increase, healthy eating patterns, and how to overall make healthier choices. Each section defines what contributes to or damages an individual’s health.

For children, weight management focuses on the goal of slowing weight gain while promoting normal growth and development in order to reduce the risk of becoming overweight as an adult. Information given on weight management is to help establish the fundamental keys of controlling body weight, which includes limiting the consumption of calories. The guidelines suggest that children engage in physical activity at least 60 minutes per day that can be divided into short bouts throughout the day. Weight
management and physical activity both contribute to the public’s health by decreasing the prevalence of overweight and obesity rates in America (USDA & USDHHS, 2010).

Few Americans consume diets that meet the guidelines’ recommendations, whether their intakes are excessive or deficient of nutrients and/or food components. Science-based evidence has shown a greater risk of chronic diseases due to the consumption of foods containing high amounts of sodium, solid fats, added sugars, and refined grains (USDA & USDHHS, 2010). It is recommended by the *Dietary Guidelines for Americans, 2010*, that less than 2,300 mg of salt should be consumed daily. The daily recommendations are 1,200 mg and 1,500 mg of sodium for Americans between the ages of 4-8 and 9-50, respectively (USDA & USDHHS, 2010). According to the *Dietary Guidelines for Americans, 2010*, fats and oils are needed as part of a healthy diet, but the type and consumption amount of each needs to be considered (USDA & USDHHS, 2010). It is recommended that children between the ages of 4 and 18 years consume between 25% and 35% of poly- and monounsaturated fat as part of the total daily calories needed (USDA & USDHHS, 2010). It is also suggested that carbohydrates, such as those contained in fruits, vegetables, grains, and milk, should be chosen wisely.

Natural sugars, such as fructose and lactose are found in fruit and milk/milk products, respectively. Added sugars are primarily used to enhance palatability but may also provide additional calories. Essential vitamins, minerals, and dietary fiber are lost when whole-grain products are refined, replacing some but all of the nutrients. Therefore, increasing the consumption of whole fruits, vegetables, and whole-grain products can
improve the inadequate intake of dietary fiber of children. Consuming fiber helps to lower the risk of diet related diseases and to control weight.

The recommendations given by the *Dietary Guidelines for Americans, 2010* are to be used to promote and maintain healthy eating patterns while making wise choices to reduce the prevalence of chronic diseases.

**MyPyramid**

An updated version of the American food guide pyramid, MyPyramid, was released by the U.S. Department of Agriculture in 2005 (Sizer & Whitney, 2006). There are several themes that the USDA included into MyPyramid, which makes it more appealing and useful than the previous food guide pyramid. The following are the guiding principles of MyPyramid:

1. Personalization – MyPyramid.gov gives personalized nutritional recommendations for specific audiences
2. Gradual Improvement – Encouragement through the MyPyramid slogan, “Steps to a Healthier You”
3. Physical Activity – Encouraged through the symbol of steps
4. Variety – Different color bands represent the 5 food groups and oils
5. Moderation – Narrowing of each food group from the bottom to the top represents foods with little or no solid fats, added sugars, or caloric sweeteners
6. Proportionality – Different width for each food group band *(Inside the pyramid: MyPyramid, 2009)*.

The www.MyPyramid.gov website can be used for children, pregnant and breastfeeding mothers, and the general population. It offers interactive tools to plan menus, assesses the amounts of each food group needed based on age, sex, weight, and
daily amount of physical activity. Children can play games that help educate them about healthy eating habits. Unlike the previous food guide pyramid, MyPyramid uses quantities in cups and ounces rather than servings. It is designed to educate individuals about a lifestyle consistent with the *Dietary Guidelines for Americans, 2010* (*Inside the pyramid: MyPyramid, 2009*).

**HEALTH-RELATED IMPACT OF POOR DIETARY BEHAVIORS**

**Metabolic Syndrome**

Metabolic syndrome is a group of risk factors associated with poor dietary intake that can affect overweight children, and can act as a preliminary predictor of obesity, cardiovascular disease, and diabetes (Steinberger et.al, 2009). Any one of the syndrome’s risk factors can develop alone, but they usually occur together as a domino effect. In order to be diagnosed as having metabolic syndrome, three of the four following conditions must be developing within the body:

- Large waistline, abdominal obesity, “apple shape”
- Abnormal blood fat levels (high LDL and low HDL)
- Higher than normal blood pressure, hypertension, the force of blood flowing through the arteries is too high
- Higher than normal fasting blood sugar level, insulin resistance (*Overweight and obesity podcast transcript*, 2008)

Each risk factor is directly related to the specific conditions previously mentioned.

The risk of metabolic syndrome increases in children and adolescents as their degree of obesity increases. Children and adolescents who are moderately obese have a 38.7%, those who are severely obese have a 49.7% chance of developing metabolic
syndrome (Steinberger et.al, 2009). Higher than normal blood pressure and the extent of build-up in the arteries are common precursors to the development of CVD (Camhi, Kuo, Young, 2008). Metabolic syndrome is also termed, insulin resistance syndrome, which can lead to type 2 diabetes (American Heart Association, 2010). Insulin resistance does not allow the body to properly utilize the insulin that it produces, the very defining characteristic of type 2 diabetes (Steinberger et. al, 2009).

Weight-related conditions have been increasingly diagnosed in children and young people, which can ultimately lead to adult morbidity and mortality (Childhood obesity, 2009).

**Overweight/ Obesity**

The prevalence of childhood obesity has increased from 6.5% to 17% for children between the ages of 6-11 over the past three decades (Childhood obesity, 2009). Both overweight and obesity are determined individually for children by measuring adiposity, the amount of fat within the body, and calculating their body mass index (BMI) (Katz, 2008). The BMI is found by dividing weight in kilograms by height in meters squared. A child’s weight is determined based on an age- and sex-specific percentile for BMI. In order for a child to be considered overweight their BMI must be at or above the 85th percentile but lower than the 95th percentile, and to be considered obese children must have a BMI at or above the 95th percentile for children of the same age and sex (CDC, 2009).
In 2001, the U.S. Surgeon General named obesity as an epidemic and a leading health problem facing the nation (USDHHS, 2001). The Centers for Disease Control and Prevention (CDC) reported that poor diet and physical inactivity accounted for more than 365,000 U.S. deaths in 2000, making obesity only second to tobacco as a cause of preventable death (Manson, Skerrett, & Willett, 2004). According to the CDC, 25% of children that are obese before the age of eight have a greater risk of being an obese adult (2009). Children are becoming overweight and obese due to a number of environmental factors combined with genetic predisposition (Manson, Skerrett, & Willett, 2004).

**Cardiovascular Disease**

Over 61 million men and women suffer from some form of disease of the heart and blood vessels, cardiovascular disease (CVD), and die from these causes (Sizer & Whitney, 2006). The development of atherosclerosis is the underlying cause of CVD, and can lead to an aneurysm, heart attack, and stroke (Reis, E. et al., 2006). In a 2008 study, it was found that over 50% of the children who participated had “cardiovascular systems that looked more like those of middle-aged adults” (Dowshen, 2009). Central obesity and lack of physical activity contribute to an individual’s risk of CVD because of elevated LDL cholesterol and lowered HDL cholesterol (Sizer & Whitney, 2006).

**Diabetes**

Diabetes in children has usually been associated with type 1 diabetes, which is insulin dependent meaning that the pancreas does not produce a sufficient amount of its
own insulin to convert glucose into energy, so artificial insulin via injection is used (Type 1 diabetes, 2009). The stress of obesity to the body causes an impaired glucose tolerance, which leads to type 2 diabetes. Type 2 diabetes is insulin independent and causes the body to become resistant to the effects of insulin or the body produces some, but not enough, insulin to maintain a normal blood sugar level (Rosenbloom, Joe, Young, & Winter, 1999).

More children are being diagnosed with type 2 diabetes due to their weight because as the body increases in fatty tissue so does the resistance of your cells to insulin (Type 2 diabetes, 2009). Diabetes was almost unknown among children and young people ten years ago, but in some communities it is the children and young people who account for 50% of the new cases of diabetes (Wechsler, McKenna, Lee, & Dietz, 2004). Children of all racial and ethnic backgrounds are being affected by the onset of type 2 diabetes, but certain populations have a higher prevalence to develop this disease. Children of Native American, Hispanic/Latino, and African American decent are at a greater risk compared to Caucasian children. Other factors that contribute to type 2 diabetes are high levels of fat in the blood, high blood pressure, polycystic ovarian syndrome (in females), Acanthosis Nigricans (darkly pigmented, velvety patches on the skin found in body folds and creases), and a family history of the disease, especially if the child’s mother had gestational diabetes (Canadian Diabetes Association, 2010 and Katz, Goff, & Feldman, 2000).
Statistics from the CDC shows that it is generally children ages 10-19 that are being diagnosed with type 2 diabetes (Diabetes prevention and control program, 2010). The American Dietetic Association (ADA) has established specific criteria for diagnosing type 2 diabetes in children.

Though type 2 diabetes can be managed through healthy eating habits and physical activity, if left untreated, the damages can be life threatening. Managing it in children must be appropriate for the age of the child. Children over the age of seven that have a BMI range between the 85th-94th percentiles, without any other medical complications, should receive treatment in the form of weight maintenance (Gavin, 2009). Weight loss and medication should be utilized as treatment for children that have additional medical complications or a BMI over the 94th percentile (Gavin, 2009).

Short-term complications of type 2 diabetes include high blood pressure (hyperglycemia), low blood pressure (hypoglycemia), and increased ketones in the urine (diabetic ketoacidosis). The more dangerous long-term complications include nerve damage and heart disease that narrows the arteries of the heart constricting blood flow because of plaque build-up (Overweight and obesity podcast transcript, 2008). Severe damage to the kidneys could require dialysis or an entire transplant, eye damage ranging from cataracts and glaucoma to blindness can also occur, and amputation of a leg or foot could be required if blood circulation is poor and the tissue dies (Type 2 diabetes, 2009).
Cancer

In 1978, there was much skepticism after Dr. Ernst Wynder and colleagues presented evidence that over one-third of all cancers in men and women in the U.S. were associated with nutritional factors (Wynder, 1979). Over 25 years later, it is still evident that poor eating habits and lack of physical activity account for 25%-30% of major cancers, such as colon, breast, kidney, and cancer of the esophagus (National Cancer Institute, 2004). The panel that developed the “Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective” report estimated that healthy eating and physical activity for weight control can prevent between 30-40% of cancer worldwide (Salerno-Kennedy & Savina, 2008).

Overweight and obesity greatly increases the likelihood of developing a number of cancerous conditions. Some studies have reported finding a link between poor eating habits and cancers of the gallbladder, ovaries, and pancreas (Overweight and obesity podcast transcript, 2008).

Colon Cancer

Colon cancer occurs more frequently in people who are obese than in those of a healthy weight and has been consistently reported for men with high BMIs. The consumption of red meat and other processed meats has been found to increase the risk of colon cancer by 12-17% and 49%, respectively (Salerno-Kennedy & Savina, 2008). In 2002, a review of observational trials found that physical activity reduced colon cancer
risk by 50% even with moderate levels of physical activity (National Cancer Institute, 2004).

**Renal Cancer**

Studies have consistently found a link between a type of kidney cancer, renal cell carcinoma, and obesity in women. The National Cancer Institute estimated that the risk of kidney cancer is 36% higher for an overweight person and 84% higher for an obese person compared to those with a healthy weight (2004).

**Esophageal Cancer**

Overweight and obese individuals are two times more likely than healthy weight people to develop a type of esophageal cancer called esophageal adenocarcinoma (National Cancer Institute, 2004). Esophageal cancer could be caused not only by excessive body weight, but also by what types of foods are consumed such as foods that use a high amount of preservation like pickles (Sizer & Whitney, 2006).

**FACTORS THAT IMPACT DIETARY INTAKE**

**Parents**

Parents act as providers, enforcers, protectors, role models, and advocates which strongly influence children when associating with their nutritional behaviors (McCaffree, 2003). As the provider, the food that is purchased and prepared in the home is dependent upon the parent’s preferences and the demographics of the household (Koren-Hakim,
Socioeconomic status (SES), food insecurity, and food cost are becoming factors that parents have to deal with when considering adequate nutrition for their child. Low SES and limited income can result in food deprivation, which is the lack of food in the home, and can lead to a destructive pattern of binge eating when food becomes available (Carpenter-Sawman, 2009). Food insecurity, which is defined as having limited or uncertain availability of nutritionally adequate and safe food on a daily basis, along with less-energy-dense foods, like fruit and vegetables, being far more expensive than processed and snack foods may also lead to poor impacts on dietary behaviors (Tufts University, 2008).

Research shows that parents may act as enforcers by restricting children’s access to particular foods increases their preference for and consumption of such foods (Davison & Birch, 2001). Parents may also lack appropriate nutritional knowledge. A 2003 study conducted by the CDC showed that 33% of mothers of obese children ages 2-11 years old thought their child’s weight was within a normal range, and failed to realize the health risks related to being overweight or obese (Koplan, Liverman, Kraak, & Wisham, 2007). Many states have proposed that parents be required to participate on local and state advisory boards established to help prevent, protect, and advocate against childhood obesity (Koplan, et al., 2007). According to McCaffree, children develop a preference for certain foods at an early age because what is served in the home “sets a pattern for the rest of the child’s life” (2003). Parents must demonstrate healthy food consumption, weight management, and physical activity behaviors.
Social Economic Status (SES), Food Availability, and Neighborhoods

Household income is a major determinant for the availability of nutritionally adequate food. This lack of proper foods can result in insecurity, which the American Dietetic Association (ADA) defines as “limited or uncertain availability of nutritionally adequate and safe foods [.,] or limited or uncertain ability to acquire acceptable foods in socially acceptable ways” (2006). In 2004, 85.6% of Ohio households, and overall 38 million U.S. residents, experienced food insecurity (ADA, 2006). This occurrence may become a problem for many families when food does become available. A lack of income can lead to food shortage then to obesity because of the tendency to overeat and indulge when the household acquires a supply of food (Carpenter-Sawman, 2009).

Food insecurity is not only the result of a household’s low income, but it can also stem from the high cost of less energy dense foods. Energy dense foods are usually processed with added fat or sugar to improve taste, while less energy dense foods are high in nutrients needed by the body. In a 2006 study conducted by Lisa Powell and colleagues from the University of Illinois at Chicago, it was demonstrated that large-chain supermarkets versus smaller non-chain supermarkets and convenience stores are more likely to stock healthy foods and offer them at lower prices (Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007). Low income, particularly urban, neighborhoods have a significantly lower number of large-chain supermarkets but a greater number of convenience stores compared to neighborhoods with higher incomes (Powell et. al, 2007). Powell based her study on U.S. zip codes and found that chain supermarkets were more likely to be in non-poor, non-urban areas, and the distance to these stores increased
as the location of specific zip codes became more urban (Powell et. al, 2007).

Furthermore, researchers have found positive correlations between the level of physical activity of children and urban neighborhoods (Molnar, Gortmaker, Bull, & Buka, 2004). Children in such areas may have limited access to safe recreation facilities or parks, which negatively affects the ongoing childhood obesity epidemic by encouraging sedentary leisure activities (Molnar, et. al, 2004).

**Media and Marketing**

Children are becoming a major market force for multiple advertising techniques, such as television advertising, in-school marketing, and toy products with brand logos. In 2006, the Institute of Medicine reported that there is compelling evidence linking food advertisement on television and the increase of childhood obesity. According to a 2007 Henry J. Kaiser Family Foundation report, children ages 8-12 view about 21 food advertisements each day, which translates into over 50 hours of food advertisements in a year (Gantz, Schwartz, Angelini, & Rideout, 2007). On the other hand, children in the same age group see an average of one public service announcement for nutrition of physical fitness every three days, accounting for less than 90 minutes of such messages (Gantz et al., 2007).

In 1997, approximately $1 billion was spent on the advertisement of snacks with high-sugar content compared to the $333 million that the USDA spent on nutrition education (Story & French, 2004). While children do not understand that media is being
utilized to market various food products, there are few policies and standards regarding advertising to children.

The Children’s Advertising Review Unit (CARU) was established by the National Advertising Review Council (NARC) in 1974. Its self-regulatory program is set in place to assure that any advertising directed toward children is not deceptive or inappropriate. The CARU standards take into account the vulnerabilities of children, such as their “inexperience, immaturity, susceptibility of being misled or unduly influenced, and their lack of cognitive skills needed to evaluate the credibility of advertising” (CARU, 2008).

The CARU of the National Council of Better Business Bureaus has no authority over advertisers and can only ask for voluntary compliance (Story & French, 2004). Research has hypothesized that if food commercial advertising was banned in the U.S. there would be an 18% reduction in the number of overweight children ages 3-11 (Chou, Rashad, & Grossman, 2008).

**Foods Prepared Outside the Home**

**Fast Food**

Fast food is defined as “food purchased in self services or carry-out eating places without wait service”, and since the early 1970’s establishment numbers have more than doubled to over 250,000 locations nationwide (Bowman, Gortmaker, Ebbeling, Pereira, & Ludwig, 2004 and Cummins, McKay, & Macintyre, 2005). Fast food restaurants such as McDonald’s, Burger King, Taco Bell, and Wendy’s are all dominant in children’s’
perception of normal dietary patterns. A study conducted by Arredondo and colleagues reported the frequencies of fast food logos by children (2009). Results showed that great exposure to fast food branding via various advertisements led to greater recognition of logos (Arredondo, Castaneda, Elder, Slymen, & Dozier, 2009). A rapidly growing form of advertisement by fast food establishments has been in the schools, where products are usually sold a la carte.

Some fast food restaurants, such as McDonald’s, have begun to offer healthier menu options with both adult and children meals. Now with McDonald’s “Happy Meals” a choice is given for French fries or apple slices, and carbonated beverages or milk (Tucker, 2011). While these healthier alternatives can help decrease the intake of high calorie, energy dense foods they must typically be requested when ordering rather than presented as an option (Tucker, 2011).

**Portion Sizing**

As children continue to grow in a world fueled by various factors that affect their dietary intake, they begin to assume that these unhealthy eating behaviors are the norm. Health economist, Eric Finkelstein, PhD, MHA, of Duke University noted that overall Americans are now consuming 1,000 more calories per week than they did 25 years ago (Tufts University, 2008). Over the past 20 years portion sizes have been on a steady increase and according to Dr. Lisa Young, a nutritionist at New York University, “super-sizing has pervaded every segment of the food industry” (Brownlee, 2002). The National Heart, Lung, and Blood Institute defined portion as the amount of a specific food chosen
by the consumer and serving as the recommended amount from each food group

(Overweight and obesity podcast transcript, 2008).

The phenomenon termed, portion distortion, is changing what Americans think normal portion sizes are when eating at or outside the home. Generally, the amount of product being consumed is not correctly assessed because of the “bang for your buck” theory. People will consume more food that is usually prepackaged, processed, convenient, and cheap when it is presented in larger sizes (CDC, 2006). In a 2002 study conducted by Rolls, Morris and Roe, it was concluded that participants ate 30% more of food when offered the largest portion and did not realize that their satiety (fullness) had been reached long before the food was finished.

SCHOOLS

Through health and physical education, schools have the power to help children adopt behaviors that will maintain nutritionally adequate diets (Clark & Fox, 2009). The CDC has published guidelines that identify school policies and practices most likely to be effective in promoting lifelong physical activity and healthy eating for students, but schools have been faced with intense pressures to raise standardized test scores which narrow the focus on specific curriculum. Ohio state law requires that health education (focusing on the nutritive value of foods, the relation of nutrition to health, and the use and effects of food additives) be incorporated into school curriculum, but the amount of instruction time is not specified within this law (State school healthy policy database: health education, 2008). The National Association of State Boards of Education
(NASBE) has realized that “health and success in school are interrelated, and schools cannot achieve their primary mission of education if students and staff are not healthy and fit physically, mentally, and socially” (Wecshler, McKenna, Lee, & Dietz, 2004).

In 2010, researchers Li and Hooker concluded that children who attend public school have higher BMIs than children that attend private school, regardless of the household’s socioeconomic status. There is a 4.5% higher probability of being overweight for children who participate in the National School Lunch Program (NSLP) and School Breakfast Program (SBP) compared to children who are ineligible or do not participate in either program (Li & Hooker, 2010).

A growing problem in U.S. schools is the extent of in-school marketing by fast food and beverage companies. Such companies are thriving in the school setting because they have the ability to reach a large audience to build up product loyalty in exchange of financially helping schools that suffer from funding shortages. Direct and indirect are the two forms of advertising that take place in schools.

Over the years direct advertising has become more persuasive and intense. Examples are brand logos in yearbooks and newspapers, athletic scoreboards and uniforms, and sponsorship banners in gymnasiums. In 2001, Minneapolis, MN teachers were offered a monthly stipend to serve as “free lance rand managers” by driving cars with vinyl coverings advertising Reese’s Peanut Butter Puffs, a sweetened General Mills breakfast cereal (Story & French, 2004). After three weeks, the campaign was ended due to great public protest. Another form of direct advertising allows companies to provide
schools with branded lesson plans, textbook covers, sample products, and lunch menu posters. Cover Concepts, a marketing company, distributes advertising products for McDonalds, Pepsi, and General Mills (Story & French, 2004).

Educational materials, as well as incentives from sponsors are forms of indirect advertising. Programs which promote reading, mathematics, and overall good grades are used by companies such as Pizza Hut’s Book It program, Domino Pizza’s Encounter Math: Count on Dominos program, and McDonalds McSpellit Club ultimately reward children for their efforts with pizza parties or coupons for free food (Story & French, 2004).

Fast food and beverage contracts prove to be profitable for both the advertising companies and the schools. With just beverages alone, over 33% of elementary schools have contracts with companies that give rights to sell products in the school (Story & French, 2004).

GOVERNMENT REGULATED NUTRITION PROGRAMS

National School Lunch and School Breakfast Program

In 1946 President Harry Truman signed the Nation School Lunch Act establishing the National School Lunch Program (NSLP), which is a federally assisted meal program operating in public and nonprofit private schools and residential child care institutions (National school lunch program, 2008). Through various eligibility requirements, children are provided with nutritionally balanced, low-cost or free lunches each school day.
Established first as a pilot program in 1966 and made permanent in 1975, the SBP provides financial assistance to states to operate nonprofit breakfast programs in schools and residential childcare institutions (School Breakfast Program, 2009).

School breakfasts and lunches must meet the recommendations of the Dietary Guidelines for Americans, which recommend that no more than 30% of calories come from fat, and less than 10% from saturated fat (Sizer & Whitney, 2006). Regulations also establish a standard for school lunches to provide one-third of the RDA of protein, Vitamin A, Vitamin C, iron, calcium, and calories, while school breakfasts must provide one-fourth of the same nutrients (Sizer & Whitney). On an average day, over 10 million children eat a school breakfast and over 30 million eat a school lunch (Clark & Fox, 2009).

Studies have shown that while school meal programs are associated with a reduced prevalence of nutrient inadequacy, there is an increased prevalence of excessive sodium and saturated fat intake (National school lunch program, 2008). Many school foodservice items are commercially prepared and therefore account for 40% of the fat and sodium in school lunches (Clark & Fox, 2009). Some children are unwilling to consume the school’s breakfast or lunch due to them not liking what is being served, but officials have attempted to balance what children will want to eat and what will provide sufficient nourishment. Additionally, shorter lunch periods and long waiting lines present the problems of children not being able to eat a school breakfast or lunch, or having too little time to complete a meal.
To help children overcome the factors that impact their dietary intake and lead to poor behaviors, the U.S. government has implemented school programs that can effectively promote healthy eating and physical activity.

**HEALTH BEHAVIOR THEORIES USED IN NUTRITION EDUCATION**

**Health Belief Model**

The Health Belief Model (HBM) is a psychological model that attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of individuals (University of Michigan: Center for Health Communications Research, 2009a and Hochbaum, 1978). It states that individuals will be motivated to carry out preventative health behaviors in response to a perceived threat to their health (Rutter & Quine, 2002).

The key variables of the HBM are as follows:

Table 1. - Health Belief Model

| Perceived Threat: Consists of perceived susceptibility and perceived severity of a health condition |
| Perceived Susceptibility: One’s subjective perception of the risk of contracting a health condition |
| • Perceived Severity – Feelings concerning the seriousness of contracting an illness or if leaving it untreated (i.e. Parents under the belief that their child is simply just a little “big” for their age and will grow out the phase) |
| • Perceived Benefits – The believed effectiveness of strategies designed to reduce the threat of illness |
| • Perceived Barriers – The potential negative consequences that may result from taking particular health actions, including physical, psychological, and financial demands |
| • Cues to Action – Events, either bodily or environmental that motivate people to take action (not systematically studied) |
| • Self Efficacy – The belief in being able to successfully execute the behavior required to produce the desired outcomes (i.e. The parent doesn’t believe in the child achieving a goal of weight loss or improvement of eating behaviors, then neither will the child) |

(University of Michigan: Center for Health Communications Research, 2009a)
Social Learning/Cognitive Theory

Human behavior, in terms of continuous reciprocal interaction between cognitive, behavioral, and environmental influences, is explained by the social learning/cognitive theory (Kearsley, 2010). Albert Bandura’s social learning theory emphasizes that behavior is acquired through interactions with others, such as parents and peers (1986). Understanding the processes of cognitions changing over time through maturation and experience enables human behavior to be understood, predicted, and changed (University of Michigan: Center for Health Communications Research, 2009b). The way that children may be influenced by their parents or peers is an example of the social learning/cognitive theory. A 2009 study conducted by Salvy, Howard, Read, and Mele examined how overweight and non-overweight children interact (play and eat) with a friend or unfamiliar peer who was either overweight or non-overweight (2009). The children who interacted with a friend, consumed more food due to the friend acting as a “permission giver”. Researchers found that the overweight children who interacted with an overweight peer also consumed more food because of a level of acceptance. Food intake was suppressed when the children were in the presence of an unfamiliar peer, possibly as a way of making a good impression. It was concluded that children use the amount of food eaten by a parent, family member, or friend as an indication of what is appropriate from them to eat as well.
Transtheoretical Model

A major stage model in health psychology is the Transtheoretical (Stages of Change) Model (TTM). Its core components are the five stages of change (Figure 1), which are pre-contemplation, contemplation, preparation, action, and relapse (Prochaska, DiClemente, & Norcross, 1992). They represent ordered categories along a continuum of motivational readiness to change a problem behavior (University of Michigan: Center for Health Communications Research, 2009c). Independent variables, known as the processes of change, serve as transitions between the stages of change.

Figure 1. – Transtheoretical Model

<table>
<thead>
<tr>
<th>Stage 1: Precontemplation</th>
<th>Individual has the problem and has no intention of changing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 2: Contemplation</td>
<td>Individual recognizes the problem and is seriously thinking about changing</td>
</tr>
<tr>
<td>Stage 3: Preparation</td>
<td>Individual recognizes the problem and intends to change the behavior within the next month</td>
</tr>
<tr>
<td>Stage 4: Action</td>
<td>Individual has enacted consistent behavior change for less than six months</td>
</tr>
<tr>
<td>Stage 5: Maintenance</td>
<td>Individual maintains new behavior for six months or more</td>
</tr>
</tbody>
</table>

(Prochaska & DiClemente, 1992)
EXAMPLES OF SUCCESSFUL NUTRITION EDUCATION PROGRAMS IN SCHOOLS

TEAM Nutrition

Developed by the USDA’s Food and Nutrition Service (FNS), TEAM Nutrition is a program that is focused on promoting the nutritional health of U.S. children. The goals of TEAM Nutrition are to improve school meal programs and teach children about healthy eating habits, along with the importance of physical activity. All efforts of nutrition education are based on the Dietary Guidelines for Americans and MyPyramid (TEAM Nutrition, 2009). As a way to change the unhealthy nutritional behaviors of children, TEAM Nutrition utilizes three strategies:

1. Training and Technical Assistance for Healthy School Meals
2. Nutrition Education
3. School and Community Support

(TEAM Nutrition, 2009)

The strategies are implemented into two programs that are housed under the TEAM Nutrition umbrella. The HealthierUS School Challenge (HUSSC) rewards schools based on their performance to create a healthy environment for children through the promotion of good nutrition and physical activity (HealthierUS school challenge, 2009). Daily physical activity and healthy eating habits are taught through the Eat Smart, Play
Smart campaign, which offers suggestions and tools to reinforce behaviors consistent with the U.S. food guidance system (*Eat smart. Play hard.*, 2009).

As a way to improve children’s nutritional eating habits and increase physical activity, several programs have been developed in schools and communities around the U.S.

**Smart Bodies**

Through Louisiana State University, a research investigation was conducted in order to increase children’s knowledge of healthy nutritional practices, as well as to improve association to and preference for fruits and vegetables (Tuuri et. al, 2009). This 12-week intervention was conducted with fourth and fifth grade students that showed an inadequacy in the consumption of fruits and vegetables. It was concluded that through teacher modeling, encouragement from cartoon-like characters, change in the school lunch menu, and parent involvement, Smart Bodies was able to improve the confidence of the students to express their interest in a fruit or vegetable as a choice instead of a high-sugar or high-calorie snack (Tuuri et. al, 2009). Though there was improvement, preference for fruits and vegetables did not change possibly due to lack of previous exposure. Further research is needed in order to determine the most effective age and number of exposure experiences necessary to bring a sustained change in preference.
**Walk & Bike to School**

Communities are incorporating the education of physical activity into children’s lives every day by encouraging them to walk and bike to school. The Safe Routes to School program in Marin County, California was established and studied during two academic school years (Staunton, Hubsmith, & Kallins, 2003). The study recognized that only one-in-nine U.S. children starts the day by walking or biking to school due to large populations being transported by bus or private vehicle (Staunton, Hubsmith, & Kallins, 2003). Along with the establishment of safe routes to school, students participated in various sub-programs that acted as incentives for them to walk or bike to school. Students were entered into raffles for small prizes according to the amount of “frequent rider miles” points accrued during a time period, were engaged in classroom education which emphasized safety training, and volunteers oversaw “walking school buses and bike trains” that allowed children to travel in organized groups. Participation in International Walk to School Day allowed schools in Marin County to increase walking by 64%, biking by 114%, and carpooling by 91% from fall of 2000 through spring of 2002 (Staunton, Hubsmith, & Kallins, 2003).

**Planet Health**

Over a two year period, a school based interdisciplinary intervention program was studied using sixth and seventh grade students in four Massachusetts communities. A complete curriculum, Planet Health, was designed to reduce the prevalence of obesity by altering children’s key physical activity and dietary risk factors (Planet health, 2007).
Planet Health was incorporated into existing school curricula by utilizing classroom teachers in four major subjects (language arts, math, science, and social studies) and physical education (Gortmaker et al., 1999). With the help of nutrition education modules, teachers encouraged students to allot a certain amount of time for more activity in their lives such as decreasing the time spent watching television and the consumption of high-fat foods, while engaging in moderate to vigorous activity and increasing the consumption of fruit and vegetables (Gortmaker et al., 1999). Each Planet Health lesson taught students through discussion ideas for small or large groups where they cooperatively learned and solved health-related issues (Planet Health, 2007). It was shown within the study that the willingness to engage in vigorous physical activity was enhanced by limiting access to sedentary activities. Both male and female participants of the study decreased the amount of time spent watching television, but it was the female participants who decreased their prevalence of obesity and increased consumption of fruit and vegetables (Gortmaker et al., 1999). Males did not show any significant changes in behavior, so further research is needed to determine why there is such a difference among between genders (Gortman et al., 1999 & Planet Health, 2007).

**Schoolyard Gardens**

In southeast Idaho, a 12-week study was conducted at local elementary school to investigate how effectively schoolyard gardens promoted healthy eating habits. Students participated in 24-hour food recalls before and after the study, as well as completed workbooks with portion size illustrations and age appropriate instructions (McAleese &
Rankin, 2007). Teachers utilized the nutrition curriculum guide, *Nutrition in the Garden*, which was developed by Lineberger and Zajicek and focuses on horticulture (1998). Students planted fall crops such as potatoes, corn, beans, and squash, two strawberry beds, and an herb garden. There are 1,100 schools registered with schoolyard gardens where students are taught about maintenance, various workshops about salsa making or herb drying, and the importance of incorporating the produce of the garden into their lunch meals (McAleese & Rankin, 2007). Results of the study showed that schoolyard gardens are emerging as an education tool due to an increase in the consumption of fruit and vegetables among students. Though the average fruit and vegetable servings per day increased from 1.93 to 4.50, it does not meet the recommended five servings per day (McAleese & Rankin, 2007). While there was a limitation to the study being only 12-weeks long, students enjoyed the success of their participation in an educational, hands-on experience.
CHAPTER III

METHODOLOGY

Purpose Statement

The purpose of READY, SET, LEARN was to develop 3rd grade nutrition education curriculum, and to evaluate the effectiveness of this nutrition curriculum on increasing the nutrition knowledge of third grade students. The lessons of the study gave students an in-depth look into the importance of having a balanced diet and understanding why it is necessary for one’s health.

Setting

From previous involvement with the Kent State University Nutrition Outreach Program, a Portage County, Ohio elementary school in the Kent school district was contacted to participate in the study.

Participants

Three third grade classrooms from one of the five Kent, Ohio public elementary schools participated in the study. Consent forms (Appendix B) were sent home with the students informing their parents/ guardians about the purpose of the study and that participation was completely voluntary. There were a total of 50 students among the three classrooms, with a participation rate equaling 66% of data collected and analyzed.
Approval of the use of the READY, SET, LEARN nutrition education curriculum and data collection was given by the Kent State University Institutional Review Board (Appendix A).

**Program Overview**

The program took place over three consecutive weeks, Monday through Thursday afternoons, November 1st-22nd, 2010. The curriculum included 10 lessons (Appendix C) covering various nutrition subjects. The primary investigator also performed an analysis of favorite foods, a two day dietary food log (weekday/weekend) that students completed with their parents/guardians as well as pre, mid, and post knowledge assessments (Appendix D).

The pre, mid, and post assessments were given November 1st, 11th, and 22nd respectively. As the assessments were presented by either the primary investigator or two trained Kent State University graduate students, it was explained to the students that no penalty would be received for incorrect responses and to give each question their best effort. Assistance was given to explain what an assessment item was asking and the response method that was needed. Because each assessment had the same questions, there was reliability and validity exhibited from the students’ responses due to the information progressively learned from the curriculum.

The dietary food logs along with a qualitative question on each assessment were used to analyze the students’ favorite foods throughout the program. Foods were
categorized in similar food groupings and results were compared over time to report any significant changes. With the post knowledge assessment, a survey in the form of a five-point Likert scale (Appendix E) was given to the students asking how they enjoyed participating in the study as well as what lessons they liked most and least.

Additional materials such as MyPyramid backpack pulls and *Nutrition Knowledge* folders were provided for the students to keep all handouts and worksheets for future reference. A post interview including a survey utilizing the five-point Likert scale and open response questions was given to the students’ Science teacher to evaluate her observations of the primary investigator and the effectiveness of the program (Appendix E).

**Data Analysis**

Before any analyses were completed, the assessments were graded and scored for each correct answer accounting for one point totaling a maximum of 16 points on the grading scale used (Appendix C). Raw score means of knowledge assessments were calculated from the collected data. Repeated measures ANOVA was completed (pre, mid, and post knowledge using SPSS (version 14.0). The data was used to determine any significant changes in the students’ knowledge according to the pre, mid, and post assessments. Significance was set at a p ≤ 0.05 apriori. A Bonferroni post hoc analysis was completed to make a pairwise comparison for time between the assessments, and they were then categorized according to whether the students’ scores had improved over such time for all significant (p ≤ 0.05) comparisons.
CHAPTER IV

RESULTS

The purpose of READY, SET, LEARN was to develop 3rd grade nutrition education curriculum, and to evaluate the effectiveness of this nutrition curriculum on the knowledge of third grade students. Data collected on the 33 third grade students were analyzed according to their pre, mid, and post assessment raw scores out of 16 points and the times at which the assessments were given (Table 2). A significant difference was demonstrated between pre and mid and post-testing p<0.001, but not between mid and post-testing (Table 3).

Table 2. –Mean Raw Scores of Pre, Mid, and Post Knowledge Assessments

<table>
<thead>
<tr>
<th>Assessment Interval</th>
<th>n</th>
<th>( \bar{x} \pm SD )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>33</td>
<td>8.92 ± 1.44</td>
</tr>
<tr>
<td>Mid</td>
<td>30</td>
<td>10.27 ± 1.71</td>
</tr>
<tr>
<td>Post</td>
<td>29</td>
<td>10.65 ± 1.74</td>
</tr>
</tbody>
</table>

Table 3. –Differences in Raw Score Knowledge Assessment*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre ( \rightarrow ) Mid Knowledge Assessment</td>
<td>( p \leq 0.001^* )</td>
</tr>
<tr>
<td>Pre ( \rightarrow ) Post Knowledge Assessment</td>
<td>( p \leq 0.001^* )</td>
</tr>
<tr>
<td>Mid ( \rightarrow ) Post Knowledge Assessment</td>
<td>0.935, ( p \geq 0.05 )</td>
</tr>
</tbody>
</table>

* Denotes significant differences, \( p \leq 0.05 \)
During the pre, mid, and post assessments participants were asked to list their favorite foods (Table 4) at each time-point. Foods were categorized into similar food groupings and the number of participants that choose foods within each grouping were counted, then given as a percentage. Foods most often given were fast food choices from restaurants such as McDonald’s, Burger King, Subway, and various pizzeria locations.

Table 4. – Percent of Responses for Favorite Foods at Pre, Mid, and Post-testing

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Pre % (n=36)</th>
<th>Mid % (n=34)</th>
<th>Post % (n=34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit</td>
<td>16.67</td>
<td>20.59</td>
<td>26.47</td>
</tr>
<tr>
<td>Vegetables</td>
<td>8.33</td>
<td>8.82</td>
<td>8.82</td>
</tr>
<tr>
<td>Protein/ Meat</td>
<td>13.89</td>
<td>23.53</td>
<td>17.65</td>
</tr>
<tr>
<td>Dairy</td>
<td>33.33</td>
<td>2.94</td>
<td>0</td>
</tr>
<tr>
<td>Simple Sugars</td>
<td>8.33</td>
<td>2.94</td>
<td>8.82</td>
</tr>
<tr>
<td>Fast Foods</td>
<td>8.33</td>
<td>29.41</td>
<td>29.41</td>
</tr>
<tr>
<td>Others</td>
<td>8.33</td>
<td>11.76</td>
<td>8.82</td>
</tr>
</tbody>
</table>

Favorite and Least Favorite Lessons

A survey was included with the post assessment, which asked student to identify their favorite and least favorite lessons of the program (Appendix E). Using an open response format with a 5-point Likert scale, the students had the opportunity to leave comments about the program to be used as feedback for future direction. Results showed that 31% of the students listed Lessons 1-3 (MyPyramid) as their favorite and 75% listed “none” or “I don’t have one” as their least favorite lesson response.
Post Interview

Overall, the Science teacher rated the READY, SET, LEARN program as “5-excellent” according to the 5-point Likert scale. Though not all of the attachments for the lessons could be accessed, she indicated that the layout, format, and content of the lessons were excellent. The grade and age appropriateness of the lessons were assessed as “4-good” because the students had yet to learn about percentages which were included with the beverages’ nutrition facts panel (Lesson 8) and they were overwhelmed with the amount of work needed to be done for the McDonald’s menu (Lessons 9-10).
CHAPTER V

DISCUSSION & CONCLUSIONS

Pre, Mid, and Post Knowledge

This study demonstrated a significant increase in knowledge from the pre to mid assessments with no increase at the post assessment. Other nutrition education interventions have produces significant changes in students’ nutrition knowledge.

A garden and classroom-based intervention in three California elementary schools reported an increase in knowledge assessment scores from pre to post test measurements (Morris & Zidenberg-Cherr, 2002). The program involved one control and two intervention schools that were able to maintain the high post test scores after a six month follow-up (Robinson-O’Brien, Story, & Heim, 2009). Another garden and education-based intervention which was conducted by Koch, Waliczek, and Zajicek at a one week summer camp in four Texas counties resulted with an increase in nutrition knowledge, especially the benefits of fruit and vegetable consumption (Robinson-O’Brien, Story, & Heim, 2009).

A multi-component program, Smart Bodies, was conducted at 16 Louisiana schools. Smart Bodies included an in-school field trip featuring “an imaginary journey through the body … [to learn] … about digestion and absorption of food”, encouragement from teachers to consume fruit and vegetables provided in meals by the
NSLP, and teacher led daily physical activity in the classroom (Tuuri et. al, 2009). The fourth and fifth grade participants had increased nutrition knowledge from pre to post assessments (Tuuri et. al, 2009).

The Social Cognitive Theory is a common framework between the before mentioned studies and READY, SET, LEARN. Bandura’s theory emphasized the idea of individuals being influences by their surrounding environment, such as peers and parents (Kearsley, 2010). The results of READY, SET, LEARN can be explained by Social Cognitive Theory. Students may have been influenced by their peers during assessments, as far as sharing answers. They may have also been influenced by their parents’ interest or lack thereof in the program.

**Favorite Food Frequencies**

Overall, the students liked foods with high fat and added sugar content, which are used to improve palatability and extend the shelf life (USDA & USDHHS, 2010). Examples of foods listed in the students’ dietary food logs were cheeseburgers, pizza, ice cream, and candy. The food preferences of children can be affected by neophobia, genetics, and their parents (Breen, Plomin, & Wardle, 2006).

Neophobia is marked by the fear and dislike of new foods, but generally disappears as one ages due to exposure to a greater number of different foods (Cooke & Wardle, 2005). In a 2006 study conducted by Breen, Plomin, and Wardle it was concluded that individuals who have a strong preference for food s with a sweet taste are
more likely to have an increased dislike of bitter tasting foods. Skinner and colleagues (2002) designed a five year, longitudinal study with 2-8 year old children analyzing their food preferences over time (Cooke & Wardle, 2005). Results showed an increase in the number of foods tried and disliked, but no change in the number of foods liked (Skinner, Caruth, Wendy, & Ziegler, 2002). The study also showed that parents’ preferences of foods will also affect their child’s preferences. If the parent dislikes a food it is less likely for the child to have any exposure to the food (Skinner et al, 2002).

Parents can also influence their child’s food preference through the manipulation of availability, such as the reward and punishment system. Common statements like, “Unless you eat your vegetables you will not have any dessert”, can cause an even greater like for the food being used as the reward rather than an actual like being established for the distasteful food (Benton, 2004). Casey and Rozin realized this problem and suggested for parents to involve children in the preparation of meals to increase and encourage various food preferences (Benton, 2004).

It has been concluded that children generally prefer sweets and energy-dense foods, like those high in fat, which according to Cooke and Wardle are all too eagerly promoted by the food industry leading to the current childhood obesity epidemic (2005). While the favorite food choices of some students may have changed overtime during the program, these changes cannot be generalized for all of the participants. Due to the short duration of the dietary food log, there may not have been an accurate representation of the students’ typical dietary intake.
Favorite and Least Favorite Lessons

On the post assessment survey the students reported that their favorite lessons were 1-3, which provided basic information about MyPyramid. Due to the students having an initial interest in these lessons can help to further explain why there was a significant increase in their raw scores from the pre to mid assessment.

Limitations

The findings of the READY, SET, LEARN nutrition education curriculum were limited by the program having a short duration of three weeks. According to Mullen and Shield (2004) in order to cause any behavior change at least 50 hours of health education is needed (Tuuri et. al, 2009). The participant sample size was small, so findings could not be generalized for all third grade students in Kent, Ohio. Performance on knowledge assessments was affected by the students’ comprehension of the questions being asked, as well as whether or not their parents held any interest in the conduction of the study.

Application

Without proper eating behaviors and engagement in physical activity children are at risk for developing medical problems that affect their present and future health, as well as overall quality of life. As children continue to grow in a world fueled by various factors that affect their dietary intake, they lack nutritional knowledge and begin to
assume that unhealthy eating behaviors are the norm. The continuance of such behaviors leads children to face the same chronic diseases and health issues that overweight and obese adults face.

**Future Direction**

Findings could be generalized not only for Kent but for all Portage County, Ohio third graders if this program was conducted with a larger sample size in multiple schools over a greater period of time, such as three months. An example is if the READY, SET, LEARN program was implemented in all five of the Kent, Ohio elementary schools then leading to implementation in all of the Portage County, Ohio elementary schools. This would allow for data collection and analysis according to student gender and school district. The program can then be incorporated into 7th and 9th grade classrooms to evaluate their nutrition related knowledge. Further research can include a more in-depth analysis of the participants’ dietary intakes via food logs and food frequency questionnaires. A school-yard garden can also be utilized for future research in addition to the classroom intervention, and data collection could be analyzed according to whether or not students’ knowledge was further increased.

**Conclusion**

The purpose of the READY, SET, LEARN program was to develop 3rd grade nutrition education curriculum, and to evaluate the effectiveness of this nutrition curriculum on the knowledge of third grade students by incorporating knowledge about
various nutrition related topics and the importance of a healthy dietary intake. The lessons of the study gave students an in-depth look into the importance of having a balanced diet and understanding why it is necessary for one’s health. Interactive, hands-on activities in the classroom allowed for the collection and evaluation of data. Analyses determined the success of the study, with students having a significant increase in their nutritional knowledge and a positive change in their dietary behaviors. Implementation of the READY, SET, LEARN program at a larger scale will show similar findings of increased nutritional knowledge and improved dietary intake that will help to stop the continuance of the childhood obesity epidemic.
REFERENCES


APPENDIX A

KENT STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD
APPLICATION FOR APPROVAL TO USE HUMAN RESEARCH SUBJECTS

Move through this document using TAB or mouse. DO NOT USE THE ENTER KEY. Please type all information. HANDWRITTEN FORMS WILL NOT BE ACCEPTED. To check a box, double-click in the box.
Submit completed form with signatures and all required attachments to the IRB REVIEWER associated with your Department or College, or to: Office of Research Safety and Compliance, Research and Graduate Studies, 137 Cartwright Hall, Phone: 330-672-2704.

Project Title: READY, SET, LEARN: Portage County, Ohio 3rd Grade Nutrition Education Curriculum

Principal Investigator
Name: Jennifer A. Bryant
Address: 
Email: jembry24@kent.edu
Phone: 
Status: Faculty
Project: Faculty Research

KSU Faculty Co-Investigator(s) (Use additional sheets if necessary)
Name: 
Address: 
Email: 
Phone: 
Status: Faculty

Faculty Advisor (If PI is a student)
Name: Natalie Caline-Bish
Address: 
Email: ncaline@kent.edu
Phone: 330-672-2148

Protocol Funding: Not-applicable
Funding Agency: 

Estimated Project Duration: Starting Date: Ending Date: (But not before approval is obtained)

IRB Reviewer Determination
Level I – Exempt, Category
Level II – Expedited, Category
Level III – Full Board review
Disapproved

Primary Reviewer 
Date
Secondary Reviewer 
Date

IRB Administration Action
Approved Level I – Exempt, Category
Approved Level II – Expedited, Category

Administrator, IRB 
Date
Chair, IRB 
Date

Meeting Date: 

Full Board Review Action
Approved 
Contingent Approval 
Tabled 
Disapproved 
Continuities Met 
Date: 

AGENDA Date 
Correspondence 
E-mail approval 
Date 
E-mail notice of initial review 
Date
**IRB NUMBER:**

**Part I: Please answer the following questions by checking the correct response.**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Will participants be identifiable to anyone other than the researchers through records, responses, or identifiers linked to the participant?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.</td>
<td>Could participants be at risk of criminal or civil liability, damage to employability or to financial standing, or undue embarrassment, if responses became known outside this research project?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3.</td>
<td>Does research deal with sensitive aspects of participants' behavior, such as illegal conduct, drug use, sexual behavior, use of alcohol, or potential harm to self or others?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4.</td>
<td>Does research involve the study of existing data? (If yes, please specify.)</td>
</tr>
<tr>
<td> </td>
<td>Documents, archives, and/or records</td>
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<td> </td>
<td>Biological specimens</td>
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<tr>
<td>4.a.</td>
<td>Is the database, archives, or record collection publicly available?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4.b.</td>
<td>Are the subjects who provided the data individually identifiable?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4.c.</td>
<td>Will any identifying information that may link your data to individuals be included in your research records?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5.</td>
<td>Does the research involve audio, video, digital, or image recordings of participants? (If yes, please specify.)</td>
</tr>
<tr>
<td> </td>
<td>Video-taped</td>
</tr>
<tr>
<td> </td>
<td>Audio-taped</td>
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<tr>
<td> </td>
<td>Photographed</td>
</tr>
<tr>
<td> </td>
<td>Other: (Specify: )</td>
</tr>
<tr>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>6.</td>
<td>Are participants free to withdraw at any time without penalty?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7.</td>
<td>Is there deception of participants? (If so, answer questions in Part VII, #35-44)</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8.</td>
<td>Does the research deal with participants under the age of 18?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9.</td>
<td>Will identifiable medical information be collected?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>10.</td>
<td>Does the research deal with any of the following vulnerable populations:</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Legally incompetent adults</td>
<td>Traumatized or Comatose</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Cognitively/Mentally impaired</td>
<td>Economically Disadvantaged</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Physically challenged</td>
<td>Terminally ill</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>Prisoners</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>11.</td>
<td>Does the project involve: (If yes, also answer question #20 on page 4).</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Administering drugs</td>
<td>Medical devices</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Administering alcohol</td>
<td>Invasive procedures</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Administering nutritional supplements</td>
<td>Drawing blood</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Taking tissue samples</td>
<td>Giving injections</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12.</td>
<td>Are you collecting any portion of your data on-line?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>13.</td>
<td>Are you requesting a waiver of any elements of the consent process?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>(If yes, answer questions in Part VIII, #43-44.)</td>
<td></td>
</tr>
</tbody>
</table>

**Part II: Summary of Research**

14.) Describe the purpose and significance of the proposed research, include sufficient background information and the specific objectives of the study. Summarize the major hypotheses. (Use non-technical language that can be understood by someone outside the discipline.)

Evaluate the effectiveness of a nutrition education curriculum in two 3rd grade classrooms at a Portage County, Ohio elementary school. The participants that receive 15 consecutive lessons during one month of the school year will have
IRB NUMBER: 

greater nutritional knowledge and dietary behavior change than the participants that receive 15 lessons over a three month period during the school year.

15.) Describe the study design, research methods and procedures. (Please append copies of the consent form and all measures, including interview questions and self-report questionnaires, to this form.) What are the qualifications of the individual(s) who will be collecting the data?

With the curriculum that was developed utilizing previous research in the area of nutrition education participants' nutrition knowledge, dietary behaviors, and intake with two separate 3rd grade classes will be measure and evaluated. One class will receive consecutive lessons while the other class receives biweekly lessons over a three month period throughout the school year.

The students will be given pre, mid, and post tests, which will not be graded, but will used to evaluate the change of their knowledge throughout the duration of the study. There will be no other follow-up requirements after the study has been completed, but the students will be keep all of their materials in a Nutrition Knowledge folder for their future reference of the information.

Part III: Research Participants

16.) Briefly describe the characteristics of your population(s). Describe the ethnic background, sex, age, state of health, and the criteria for inclusion or exclusion of participants. (Include rationale for use of special classes of participants such as pregnant women, children, institutionalized mentally disabled, prisoners, or those whose ability to give voluntary informed consent may be in question.) If your population is one gender or ethnic group, please explain.

The participants will be male and female 3rd grade students, typically between the ages of 8-10. In this study there are not any specifically targeted populations in terms of ethnic backgrounds. The participants that are in the participating classrooms will be included in the study, with parental consent and assent, regardless of population characteristics. The classroom roster will serve as the list of participants in the study.

17.) Indicate the anticipated sample size.

Two 3rd grade classrooms at a Postage County, Ohio elementary school will participate in this project. The exact sample size will depend on the number of students listed on the classroom roster.

18.) Explain the recruitment process. State how potential participants will be identified and who will make the initial contact. Explain how you will ensure that recruitment and selection of participants is equitable. (Please include all recruitment materials, including scripts, flyers, and advertisements as attachments to this form.)

The participating elementary was recruited through the faculty advisor's familiarity with the with the school. The school is a participant in the USDA Nutrition Outreach Program's Healthy Munch Bunch, so there has been previous interaction with the staff and students. The participants will only be identified as students in either classroom #1 or classroom #2.

Part IV: Risks/Benefits

19.) Identify any expected or potential risks or discomforts (including physical, psychological, social, or legal) to which participants may be exposed as a result of participation in the research project (beyond those encountered in everyday life).

There is a potential risk of allergic reaction to the food items chosen for one of the lessons where the participants will be taught about healthy snacking.

a) What safeguards will you use to protect the participants from those risks, as well as to protect their rights, welfare, and privacy? (Must provide a response; never answer "N/A").

In the consent form the parents will be notified of this lesson and will be given a list of the ingredients for the snack, then will be asked if there are any allergy concerns. Within the lesson, an alternative snack will be available for participants who may have an allergy to any of the primary snack ingredients.

20.) Describe the anticipated benefits to individual subjects and to society expected to be gained from this project. (This should include any direct benefits to the participants as well as any generalized gain in knowledge. If there are not direct benefits to individual subjects, state that.)

The participants will overall gain knowledge about nutrition education and proper dietary behavior. It is expected that the participants improve their existing dietary behaviors at school and home.

21.) Describe the qualifications of the person administering drugs, alcohol, or nutritional supplements, or drawing blood, taking tissue samples, or giving injections.

Please note:
IRB NUMBER: __________

i. Persons doing venipuncture must provide a copy of their certification to draw blood and proof that they completed a blood-borne pathogens training course.
ii. Indwelling vascular catheters and lines can only be inserted and accessed by licensed/registered/certified medical personnel such as physicians, RNs, and EMTs. Proof of certification is required.
iii. Arterial blood sampling can only be carried out in an appropriate medical facility such as a hospital, clinic, or the KSU Health Center. The procedure can only be carried out by qualified personnel under the direct supervision of a licensed physician.

22.) Describe any form of compensation to participants. (i.e., money, extra credit, etc. If money, extra credit, or grade is given to students who participate in the project, what opportunity for extra credit or grade is provided to students who choose not to participate?)

   Please note:
   a. If the research participation affects the course grade (e.g., extra credit), then alternative opportunity for course credit is needed.
   b. For multi-phase projects, compensation should not be contingent upon completion of the whole project. Rather, some compensation should be given for each phase of the project. The nature of the compensation should be stated in the consent form.

Within the curriculum, two of the lessons include educational games where the participants will be on opposing teams. The winning team will receive a small prize such as a nutrition education pencil, sticker, or temporary tattoo.

23.) Research participants will be informed of the risks and benefits through:
   - Consent form (Include with application)
   - Verbal Script (Include with application)
   - Parental Consent form for parents/guardians (required for children 18 of age and younger)
   - Assent form (in addition to Parental Consent form for children 12 years of age and younger)

Part V: Informed Consent (You must include a copy of the informed consent document with application materials. Visit the IRB website for more information about informed consent documents)

24.) Describe the consent process. Explain when and where consent will be obtained and identify who will be obtaining informed consent.

25.) If you will be using children under 18, explain in detail how you will obtain parental consent and assent (for children under 12) or consent (for children 12 to 18). If assent/consent will be obtained orally, supply a script of what you will say and how you will give the children the opportunity to agree to participate or decline.

26.) Explain how the possibility of coercion or undue influence will be minimized in the consent process (e.g., if employer is approaching employees, instructors are approaching students, physicians are approaching patients, if compensation is involved, etc.). The participants will be informed that they will not receive any penalties if they or their parents do not agree with their participation in this project.

Part VI: Privacy and Confidentiality of Records

27.) Will this study use or disclose protected health information from a covered entity (a covered entity is a Doctor, Clinic, Dentist, Pharmacy, Health Clinic etc... that sends transactions electronically) as defined in the Health Insurance Portability and Accountability Act (HIPAA)?
   - [ ] Not Applicable
   - [ ] Applicant will use a HIPAA Authorization (specify type below)
   - [ ] Form provided by covered entity
   - [ ] Form created by applicant
   - [ ] Applicant requests IRB waiver of Authorization

28.) Where will the signed consent forms be kept? [Consent forms must be kept in a secured location on campus, not in a private home or office. If the study does not involve consent forms, answer "N/A".]

   The forms will be kept in the faculty advisor's office at KSU Nixon Hall.
IRB NUMBER: __________

29.) Describe specifically how you will maintain the confidentiality of the data. The school will only be known as a Portage County elementary school and the students will only be identified as either being in classroom #1 and classroom #2.

30.) How will the data/results of the research be disseminated?
- [ ] Thesis
- [ ] Dissertation
- [ ] Public presentation
- [ ] Other: Specify:
- [ ] Publication
- [ ] Course Requirement: Course #:

31.) How will the data be stored after study completion? Please be specific as to the retention or destruction of audio/video data or cell files.

32.)
   a). If the participants’ personal files (school, medical, etc.) will be read, where are the files kept (name the place, e.g. doctor’s office, hospital, clinic, etc.) and who will gather the information? None of these files will be needed for this project.
   b). Has permission been obtained to gather this information? (Attach documentation)
   c). Do the participants (and/or their parents or guardians) know that these files will be read? If no, explain.

33.)
   a). Will individual results or other data be disseminated to the participants (and/or their parents or guardians)? No.
   b). If so, explain the qualifications of the person(s) interpreting the results.

34.) Does the proposed study involve deception?  [ ] No  [ ] Yes (Please complete Part VII)

Part VII: Projects Involving Deception

35.) Describe the type of deception being used. Consider in your answer both deception by omission (an important aspect of the research is withheld from the subject) and deception by commission (the subject is misled about the true purpose of the research).

36.) Why is deception a necessary and unavoidable component of the experimental design? (Does the deception improve the internal or external validity of the study?)

37.) Has this research protocol (involving deception) been previously used? If “Yes,” please provide information on any actual harms to the participants and reactions of the participants to the use of deception in this research.

38.) What alternative procedures were considered that did not involve deception and why were these alternatives rejected?

39.) Since deception precludes informed consent by the subject prior to participation:
   a). How will participants be debriefed?
   b). Who will debrief them?
   c). Will the debriefing of participants be:
IRB NUMBER: ____________

☐ Immediate (immediately following the experimental session in which deception occurs)
☐ Delayed
☐ Full (all deceptive aspects of the study will be revealed)
☐ Partial (some deceptive aspects of the study will remain unexplained)

40.) If debriefing is delayed, why is delayed debriefing necessary and when will debriefing occur?

41.) If debriefing is partial, why is the partial debriefing necessary? Why is unexplained deception necessary? Would the subject be harmed in any way by full debriefing?

41.) Even if the subject is partially debriefed during the study, will full debriefing occur later?

42.) Does the presence of deception increase the risk of harm to the subject?

43.) Is the respondent free to withdraw his/her data after being fully debriefed? (e.g., form like audio/video taping).
Part VIII: Request for Waiver of Elements of Informed Consent

43.) Are you requesting a waiver of the documented informed consent form for each participant? □ Yes □ No

Please indicate the justification for requesting this waiver:

□ The only record linking the subject to the research would be the signed consent document and the principal risk of the research would be breach of confidentiality.

□ The research involves only minimal risk to the subjects and involves no procedures for which written consent is normally required outside of the research context (e.g., anonymous surveys of adults).

Note: Participants must still be provided with a written statement regarding the research that contains the required elements of informed consent. Refer to the Informed Consent Template on our website for more information.

44.) Are you requesting a waiver or alteration of any of the other required elements of informed consent? □ Yes □ No

(An IRB may, on occasion, approve a consent process that omits some or all of the required elements of informed consent or waive the requirement for informed consent. The following criteria must be met: 1) the research involves no more than minimal risk; 2) waiver or alteration will not adversely affect the rights and welfare of subjects; 3) the research could not practically be carried out without waiver or alteration, and 4) when appropriate, the subjects will be provided with additional pertinent information after participation.)

a.) Provide justification for the waiver.

b.) Indicate why the proposed research presents no more than minimal risk to participants.

c.) Explain whether or not a waiver of written informed consent would adversely affect the rights and welfare of participants.

d.) Explain why it would be impracticable to carry out the research without a waiver or alteration of informed consent.

e.) How will pertinent information be provided to participants, if appropriate, at a later date?

Part IX: Conflict of Interest

45.) Do the researchers conducting this protocol have any potential conflicts of interest? Conflicts of interest may include financial or personal interest, or any condition in which the investigator’s judgment regarding a primary interest may be biased by a secondary interest. Examples include speaking and consultation fees, travel expenses, stock options, royalties, company ownership or equity, etc.

□ No □ Yes (If yes, conflict of interest must be disclosed)
IRB NUMBER: ____________

**Investigator Assurance**

I certify that the information provided in this application is complete and correct. I understand that as Principal Investigator, I have ultimate responsibility for the protection of the rights and welfare of human research subjects, the conduct of the study, and the ethical performance of the project.

I agree to comply with all Kent State University policies and procedures on research involving human subjects (KSU policy #8342-3-03.2), as well as with all applicable federal, state, and local laws regarding the protection of human subjects in research. I agree that:

- The project will be performed by qualified personnel, according to the KSU approved protocol.
- Approval from the Institutional Review Board will be obtained prior to implementing any changes to the protocol.
- If the project involves approval/permission from other institutions, the research will not begin until permission has been obtained from these institutions.
- Legally effective informed consent will be obtained from human subjects if applicable, and documentation of informed consent will be retained in a secure environment for three years after termination of the project.
- Injuries, adverse events, and/or unanticipated problems involving risks to subjects or others will be reported in writing to the Kent State University IRB promptly, and no later than within 5 working days of the occurrence.
- A Continuing Review and Progress Report will be completed and submitted before the review deadline, as determined by the IRB appropriate to the degree of risk (but not less than once per year). All protocols are approved for a maximum period of one year. Research must stop at the end of the approval period unless the protocol is re-approved for another term.
- All research staff, employees, and students assisting in the conduct of the research will be informed of their obligations and responsibilities in the above commitments.

I further certify that the proposed research will not begin until approval has been obtained. A signed approval letter from the Office of Research Safety and Compliance communicates IRB approval.

__________________________  ________________________
Signature of Principal Investigator  Date

__________________________  ________________________
Signature of Co-Investigator  Date

**Faculty Advisor Assurance:**

I have reviewed and approved the research project described in this application. I agree to meet with the student on a regular basis to monitor study progress and assure that the well-being of subjects is adequately safeguarded. I agree to be available to assist the student investigator should any problems arise in the study.

__________________________  ________________________
Signature of Faculty Advisor  Date
**IRB NUMBER:** __________

**Kent State University Institutional Review Board**  
Application for Approval to Use Human Research Subjects

**CHECKLIST:** THE FOLLOWING MATERIALS MUST BE SUBMITTED WITH THE APPLICATION FOR APPROPRIATE REVIEW (Note: all items may not be necessary for the specific application)

Double click on the box, a window will appear asking if it should be checked or unchecked

<table>
<thead>
<tr>
<th>CHECK IF NECESSARY:</th>
<th>FORMS SUBMITTED:</th>
<th>APPENDIX LETTER OR NUMBER (IF NOT NECESSARY, MARK “N/A”):</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>Completed Application <em>(including signatures)</em></td>
<td></td>
</tr>
<tr>
<td>□</td>
<td>Recruitment script and materials</td>
<td></td>
</tr>
<tr>
<td>□</td>
<td>Surveys, questionnaires, interview questions</td>
<td></td>
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<tr>
<td>□</td>
<td>Data collection materials</td>
<td></td>
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<tr>
<td>□</td>
<td>Informed Consent Documents</td>
<td></td>
</tr>
<tr>
<td>□</td>
<td>Audio/Visual Consent Forms</td>
<td></td>
</tr>
</tbody>
</table>
| □                    | Assent Statement/Script  
  *(for children ≤ 12, will also need parental consent form)* |                                                          |
| □                    | Debriefing Script                                           |                                                          |
| □                    | Approval from other institutions                           |                                                          |
| □                    | Signed Investigator Assurance                              |                                                          |
| □                    | Training Verification/CITI certificate                     |                                                          |
Informed Consent to Participate in a Research Study

Study Title: READY, SET, LEARN: Portage County, Ohio 3rd Grade Nutrition Education Curriculum

Principal Investigator: Jennifer A. Bryant, Nutrition & Dietetics Undergraduate Kent State University

Your child(ren) is(are) being invited to participate in a research study. This consent form will provide you with information on the research project, what you will need to do, and the associated risks and benefits of the research. Your child's participation is voluntary. Please read this form carefully. It is important that you ask questions and fully understand the research in order to make an informed decision. You will receive a copy of this document to keep in your personal records.

Purpose:
The purpose of this research study is to measure the effectiveness of nutrition education curriculum on changes in dietary behaviors and knowledge in a 3rd grade classroom.

Procedures
Your child's classroom will receive consecutive lessons over a three week period during the school year. Your child's teacher will be aiding the researchers in the classroom activities surrounding these lessons. As part of the curriculum, students will be given an assignment that asks them to log their dietary intake using MyPyramid handouts. The researchers would like to collect these diet logs and assess their dietary intake changes before and after the lessons. The diet logs will be given to the researcher with only number coding so that we will not be able to identify any of the students' particular work. Only the teacher will know which diet log is which students. The students will also be given written questions in the form of assignments about each of the lessons of which both the teacher and the researchers will be involved in developing as the lessons are being given. Again, the researchers will not be able to identify any of your child's work because your child will be given a number that is only identifiable to the teacher. No grades will be shared with the researchers.

There will be no other follow-up requirements after the study has been completed, but the students will be able to keep all of their materials in a Nutrition Knowledge folder for future reference to the information.

The classroom lessons are as follows:
1-3: MyPyramid for Kids
4: Food Safety
5: Snacking and Portion Sizes
6-7: Vitamins / Minerals
8: Beverages
9-10: Fast Food

Audio and Video Recording and Photography
There will not be any audio or video recording and/or photography involved in this research study.

Benefits
The potential benefits of participating in this study may include an increase in your child’s nutritional knowledge, as well as an improvement in dietary behaviors. Participation in this study will also help us to better understand how children enjoy learning about such an important subject and whether they actually retain the information given. We would like for the lessons taught in the classroom to carry over to the home in future efforts to combat the ever-growing childhood obesity epidemic.

Risks and Discomforts
There are no anticipated risks with this study beyond those encountered in everyday life.

Privacy and Confidentiality
Each child will be given a number and researchers will not be able to identify a particular students’ work. Only your child’s teacher will be able to identify your child’s work. Researchers will also not be involved in the grading process on any materials used in the curriculum you’re your child’s grades will not be shared with the researchers. Research participants will not be identified in any publication or presentation of research results; only aggregate data will be used.

The school will only be identified as a Portage County elementary school and the students will have data entered as being enrolled in the classroom.

Compensation
Other than the general knowledge that is hoped to be gained by the research participants, there are no other forms of compensation.

Voluntary Participation
Taking part in this research study is entirely up to you and your child. You may choose not to have them participate or you may discontinue their participation at any time without penalty or loss of benefits to which they are otherwise entitled. Though this study takes place in the classroom, your child’s grades will in no way be affected by their participation. You will be informed of any new, relevant information that may affect your child’s health, welfare, or willingness to continue their study participation.
Contact Information
If you have any questions or concerns about this research, you may contact Jennifer Bryant at jbryan24@kent.edu or Natalie Caine-Bish, Ph.D, RD, LD at (330) 672-2148 or neaine@kent.edu. This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at (330) 672-2704.

Consent Statement and Signature
I have read this consent form and have had the opportunity to have my questions answered to my satisfaction. I voluntarily agree to my child’s participation in this study. I understand that a copy of this consent will be provided to me for future reference.

_____________________________  ______________________________
Participant Signature             Date
APPENDIX B

Dear Third Grade Parent/Guardian,

The purpose of this letter is to inform you of the READY, SET, LEARN program that your child will be participating in during this school year. Your child’s participation will help to complete an investigation and evaluate the effectiveness of a newly developed nutrition curriculum on changes in dietary intake and nutrition knowledge of third grade students. The importance of this investigation is to help to create measures to prevent the continuance of the childhood overweight and obesity epidemic.

The percentage of overweight children in the United States is growing at an alarming rate, with one out of every three children now classified as being overweight or obese. The Dietary Guidelines for Americans, 2005 recommends that children over the age of two get at least 60 minutes of moderate to vigorous physical activity, preferably all days of the week. A study has shown that some school physical education classes offered third-graders only 25 minutes of vigorous activity each week. This may be due to financial and time restraints on nutrition education because of the intense pressure for schools to raise standardized testing scores. In turn, these restraints put more stress on teachers because they must incorporate nutrition into their curriculum possibly without having the background knowledge in health education.

National survey data shows that some children do not consume enough vitamins and minerals needed to maintain health and support growth and development. Overweight and obese children are at risk for developing medical problems, such as diabetes, heart disease, hypertension, and/or difficulty in breathing that can affect their present and future health, as well as overall quality of life. In 2004, the Centers for
Disease Control and Prevention researchers reported that poor diet and physical inactivity accounted for more than 365,000 U.S. deaths in 2000.

Due to the state of Ohio requiring that health education (focusing on the nutritive value of foods, the relation of nutrition to health, and the use and effects of food additives) be incorporated into school curriculum, READY, SET, LEARN will allow children to learn more through hands-on experiences and teachers will not have the task of creating specific lesson plans or conducting research on nutrition curricula that will be effective for students. The lessons are provided by the Kent State University Nutrition Outreach program for teachers and each will have detailed instructions on how to carry out the lesson. Areas of health education that the lessons will cover range from general MyPyramid (updated Food Pyramid) information, to food and sanitation safety, to a presentation day for the students.

With your help READY, SET LEARN will be able to address the critical need for children, as well as adults, to achieve healthy eating habits and gain sufficient nutritional knowledge. Each lesson will be accompanied with a take-home letter and a tear-off slip (that will need to be signed) to make sure you are informed about the lesson’s learning objectives. The students will be keeping all of their work in Nutritional Knowledge folders that will be provided, so that they can always look back to the READY, SET, LEARN lessons for future reference.

Thank you for your support of the READY, SET, LEARN nutrition curriculum.

Sincerely,

Jennifer A. Bryant, Undergraduate Nutrition and Dietetics
Kent State University
School of Health Sciences
Email: jbryan24@kent.edu

Natalie Caine-Bish, Ph.D., R.D., L.D.
Associate Professor
Nutrition and Dietetics
School of Health Sciences
Phone: 330-672-2148
Fax: 330-672-2194Email: ncaine@kent.edu
Dear Third Grade Parent/Guardian,

The purpose of this letter is to inform you of the dietary food log to be completed for the READY, SET, LEARN program that your child is participating in during this school year.

The dietary food log will allow us to analyze your child’s diet, and will help to further demonstrate why preventative measures are needed against the childhood obesity epidemic. To get an accurate account of your child’s diet, it is asked that the diet log be completed over a three day period (two weekdays and one weekend day). Included with this letter is an example of a dietary food log. We ask that the dietary food log be completed and turned into your child’s homeroom teacher by Monday, November 11, 2010.

Your child will not be penalized if you not to have them participate in this activity, but with your help READY, SET LEARN will be able to address the critical need for children, as well as adults, to achieve healthy eating habits and gain sufficient nutritional knowledge.

Thank you for your support of the READY, SET, LEARN nutrition curriculum.

Sincerely,

Jennifer A. Bryant, Undergraduate Nutrition and Dietetics
Kent State University
School of Health Sciences
Email: jbryan24@kent.edu

Natalie Caine-Bish, Ph.D., R.D., L.D.
Associate Professor
Nutrition and Dietetics
School of Health Sciences
Phone: 330-672-2148
Fax: 330-672-2194
Email: ncaine@kent.edu
Dear Third Grade Teacher,

The purpose of this letter is to inform you of the READY, SET, LEARN program that you and your students will be participating in during this school year. Participation will help to complete an investigation and evaluate the effectiveness of a newly developed nutrition curriculum on changes in dietary intake and nutrition knowledge of third grade students. The reason for such an important investigation is to create measures to prevent the continuance of the childhood overweight and obesity epidemic.

The percentage of overweight children in the United States is growing at an alarming rate, with one out of every three children now classified as being overweight or obese. The Dietary Guidelines for Americans, 2010 recommends that children over the age of two get at least 60 minutes of moderate to vigorous physical activity, preferably all days of the week. A study has shown that some school physical education classes offered third-graders only 25 minutes of vigorous activity each week. This may be due to financial and time restraints on nutrition education because of the intense pressure for schools to raise standardized testing scores. We understand the stress that is then placed on you to incorporate nutrition into your curriculum, whether or not you have the background knowledge in health education.

Research which shows that only 2% of school aged children meet the food guide pyramid serving recommendations for the five major food groups supports the national survey data demonstrating that some children do not consume an adequate amount of vitamins and minerals needed to maintain health and support growth and development. In 2004, the Centers for Disease Control and Prevention researchers reported that poor diet and physical inactivity accounted for more than 365,000 U.S. deaths in 2000.

READY, SET, LEARN will allow children to learn more through hands-on experiences and you will not have the task of creating specific lesson plans or conducting
research on nutrition curricula that will be effective for students. You will receive a binder of lessons that are previously prepared and each will have detailed instructions on how to carry out the lesson. Each lesson will be accompanied with a take-home letter and a tear-off slip (that will need to be signed) to make sure parents/guardians are informed about the lesson’s learning objectives. The students will be keeping all of their work in *Nutritional Knowledge* folders that will be provided, so that they can always look back to the *READY, SET, LEARN* lessons for future reference. Areas of health education that the lessons will cover range from general MyPyramid (updated Food Pyramid) information, to food and sanitation safety, to a presentation day for the students. With your help *READY, SET LEARN* will be able to address the critical need for children, as well as adults, to achieve healthy eating habits and gain sufficient nutritional knowledge.

Thank you for your support of the *READY, SET, LEARN* nutrition curriculum.

Sincerely,

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School of Health Sciences  
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APPENDIX C

READY, SET, LEARN: Portage County 3rd Grade Nutrition Education Curriculum

Introduction

Welcome to the 1st day of the READY, SET, LEARN curriculum project! This day will be used for introductions with the students, and explaining why this project is being carried out.

Questions that can be asked to initially get students engaged in the project are:

1. What makes a food good for your health?
2. Why is it important to eat healthy?
3. What are the benefits of eating healthy?
4. What do you think obesity means?

Nutritional Knowledge folders will be issued to students, and can be used to keep all of their worksheets and handouts for future reference. The students will also be given pre, mid, and post-assessments, which will not be graded, but it is encouraged that all questions are answered (even if it is a guess). An assessment will be given each week of the project, which has identical questions covering each of the lessons being taught to the students. The lessons are as follows:

Lesson 1: MyPyramid
Lesson 2: MyPyramid (cont’d)
Lesson 3: MyPyramid (cont’d)
Lesson 4: Sanitation Measures
Lesson 5: Snacking/ Portion Sizes
Lesson 6: Vitamins/ Minerals
Lesson 7: Vitamins/ Minerals (cont’d)
Lesson 8: Beverages
Lesson 9: Fast Food
Lesson 10: Fast Food (cont’d)
Lessons 1-3: MyPyramid Introduction

MyPyramid is an updated version of the American food guide pyramid, which was developed in 2005 by the United States Department of Agriculture. It offers interactive tools that are designed to educate individuals about a lifestyle consistent with the Dietary Guidelines for Americans (Inside the Pyramid: MyPyramid, 2009). The MyPyramid slogan, “Steps to a Healthier You”, encourages gradual improvement and physical activity. The five groups and oils are represented by different color bands that have varying widths to designate variety and proportionality. Moderation is denoted by the narrowing of each food group from the bottom of the band to the top representing foods with little or no solid fats, added sugars, or caloric sweeteners. The MyPyramid food groups are:

- Grains are foods produced from wheat, rice, oats, barley, and cornmeal. The two subgroups of grains are whole and refined. Whole grain products use the entire grain kernel, while refined grain products have been processed to improve shelf life. Processing the grain removes dietary fiber, iron, and many B vitamins so they must be enriched to add back the nutrients that were previously lost. Examples of grain products are bread, crackers, oatmeal, pastas, and breakfast cereals.

- Vegetables are regarded as any vegetable or 100% vegetable juice, such as Campbell’s V8. They can be prepared in a variety of ways, for instance steamed, boiled, baked, mashed, canned, or simply raw. Vegetables are divided into five subgroups: dark green vegetables, orange vegetables, starchy vegetables, dry beans and peas, and other vegetables. Examples of each subgroup, respectively, are broccoli, carrot, corn, black beans, and asparagus.

- Fruits are considered as any fruit or 100% fruit juice. Fruits may be eaten fresh, canned, frozen, or dried. Common examples of fruits are apples, berries, melons, grapes, and oranges. Many consumers may be misled about the difference between 100% fruit juice and fruit drink. Fruit juice contains 100% natural juice and provides the body with essential nutrients. Fruit drinks, however, only contain
a small percentage of natural fruit juice, lack essential nutrients, and are made with high amounts of sugar.

- Milk products that are either fluid or made from milk, and retain their calcium content are placed into this food group. All fluid milk, milk-bases desserts, cheese, and yogurt are the subgroups within the milk food group.

- Meat and Beans are credited as all products made from meat, poultry, fish, dried beans, eggs, nuts, and seeds. Products of this group provide healthy oils and nutrients needed by the body. Examples of foods from the meat and beans group are beef, chicken, kidney beans, almonds, and catfish.

- Oils are liquid at room temperature, and can be used for cooking and flavoring. Canola oil, olive oil, and corn oil are the examples of oils that come from plants. Oils are used to manufacture mayonnaise, salad dressings, and soft margarines that are sold in tubs. Solid fats, like shortening, are the products of animals. Vegetable oils can also be used to make solid fats through hydrogenation, which gives the fats a longer shelf life.

(Inside the Pyramid: MyPyramid, 2009).

The MyPyramid.gov website can be used by educators, where they can print worksheets and posters for the classroom.

Additional Resources:


LESSONS 1-3: MyPyramid for Kids

Overall Learning Objectives:

- Introduce students to the principles of MyPyramid for Kids
- Students will understand the importance of and benefits associated with all of the five food groups and oils

LESSON 1

Learning Objectives:

- Students will identify the food groups and the correct recommended intakes of each group
- Students will identify and understand the importance of the food groups

Supplies Needed:

- MyPyramid for Kids poster
- MyPyramid for Kids blank chart
- Chalkboard (if needed)
- Crayons / colored pencils / markers
- Nutritional Knowledge folders
- Dietary Log Informational letter (for parents)

Prior to Lesson:

- Review the Lessons 1-3 Introduction
- Xerox copy the MyPyramid for Kids poster, MyPyramid for Kids blank chart (need one for each student), and Dietary Log Informational letter

During the Session (Teacher Will):

1. Give each student a MyPyramid for Kids blank chart. Using the MyPyramid for Kids poster review the **grains, vegetable, and fruit** food groups in detail, explaining the significance of band colors, different band widths (found in Introduction), recommended intakes, and examples of foods from each group. The students will write the information given to them on their MyPyramid for Kids blank charts. To minimize interruptions, it may be helpful to copy the recommended intakes of each group and food examples onto the chalkboard.
2. After going through the respective food groups, instruct the students to use the supplies (crayons, colored pencils, and/or makers) provided to fill out their MyPyramid for Kids blank charts. Students are to correctly color the bands and draw an example of the foods listed.

**DURATION: VARIES** (can be completed during free time or at home)

Students Will:

1. Review the MyPyramid for Kids poster, focusing on the recommendations of the reviewed food groups
2. Color the MyPyramid for Kids blank chart according to the reviewed food groups
3. Identify the recommended serving size and draw an example of a food that falls under the reviewed groups

**Important** - Send the dietary food log parent informational letter home with the students. This letter will help explain how to complete a dietary food log for students and provides an example of a completed food log respective to a child’s diet.
LESSON 2 (cont’d. from Lesson 1)

Learning Objectives:

- Students will identify the food groups and the correct recommended intakes of each group
- Students will identify and understand the importance of the food groups

Supplies Needed:

- MyPyramid for Kids poster (from Lesson 1)
- MyPyramid for Kids blank chart (from Lesson 1)
- Chalkboard (if needed)
- Crayons / colored pencils / markers
- Nutritional Knowledge folders

Prior to Session:

- Have the students take out the work that they completed during Lesson 1

During the Lesson (Teacher Will):

1. Using the MyPyramid for Kids poster review the milk, meat & beans, and oil food groups in detail, explaining the significance of band colors, different band widths (found in Introduction), recommended intakes, and examples of foods from each group. The students will write the information given to them on their MyPyramid for Kids blank charts.
   **DURATION: 20-30 MINUTES**
2. After going through the respective food groups, instruct the students to use the supplies (crayons, colored pencils, and/or markers) provided to fill out their MyPyramid for Kids blank charts. Students are to correctly color the bands and draw an example of the foods listed.
   **DURATION: VARIES**
3. Hang the MyPyramid for Kids poster in a visible location in the classroom, so the students can go to it for future reference.
4. Once the students are done have them place their completed MyPyramid for Kids charts in their Nutritional Knowledge folders.
LESSON 3

Learning Objectives:

- Students will continue to understand the importance of consuming the recommended intakes from all of the food groups
- Students will identify the various components of MyPyramid for Kids

Supplies Needed:

- MyPyramid Jeopardy instructions worksheet and questions
- Chalkboard
- Chalk (colors for each respective food group)
- Stickers for the winning team

Prior to Session:

- Divide the class into two groups and have students create nutrition-related team names
- Using the MyPyramid Jeopardy worksheet, draw the game categories on the chalkboard

During the Lesson (Teacher Will):

1. Refer to the MyPyramid Jeopardy instructions worksheet and read the rules to the students, emphasizing the importance of the students raising their hands in order to earn points for their answers.

**DURATION: 30-40 MINUTES**

Students Will:

1. Through a game formatted like Jeopardy, review Lessons 1 and 2 about the MyPyramid for Kids
MyPyramid for Kids
Eat Right. Exercise Have Fun.
MyPyramid.gov

Grains
Make half your grains whole
Start smart with breakfast. Look for whole-grain cereals.
Just because bread is brown doesn’t mean it’s whole grain. Search the ingredients list to make sure the first word is “whole” like “whole wheat”.

Vegetables
Vary your veggies
Color your plate with all kinds of great-tasting veggies.
What’s green and orange and tastes good? Veggies! Go dark green with broccoli and spinach, or try orange ones like carrots and sweet potatoes.

Fruits
Focus on fruits
Fruits are nature’s treats — sweet and delicious. Go easy on juice and make sure it’s 100%.

Milk
Get your calcium-rich foods
Move to the milk group to get your calcium. Calcium builds strong bones.
Look at the carton or container to make sure your milk, yogurt, or cheese is low-fat or fat-free.

Meat & Beans
Go lean with protein
Eat lean or low-fat meat, chicken, turkey, and fish.
Ask for it baked, broiled, or grilled — not fried. It’s juicy, but true. Nuts, seeds, peas, and beans are all great sources of protein, too.

For a 1,600-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.

- Eat 6 oz. Every day
  - Eat 2 1/2 cups every day
  - Eat 1 1/2 cups every day
  - Eat 3 cups every day
  - Eat 5 oz. every day

Oils
Oils are not a food group, but you need some for good health. Get your oils from fish, nuts, and liquid oils such as corn oil, soybean oil, and canola oil.

Find your balance between food and fun
- Move more. Aim for at least 60 minutes everyday, or most days.
- Walk, dance, bike, rollerblade — it all counts. How great is that!

Fats and sugars — know your limits
- Get your fat facts and sugar smarts from the Nutrition Facts label.
- Limit solid fats as well as foods that contain them.
- Choose foods and beverages low in added sugars and other caloric sweeteners.

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LESSONS 1-3: MyPyramid for Kids

MyPyramid for Kids Jeopardy

Explain to the students that they will be playing a game to review what they have learned about MyPyramid for Kids during Lessons 1-2.

1. Divide the class into two (2) teams, and have the students create team names based on the food groups they have learned about.
2. Draw the MyPyramid for Kids Jeopardy board on the chalkboard.

As Follows:

<table>
<thead>
<tr>
<th>Grains</th>
<th>Vegetables</th>
<th>Fruits</th>
<th>Milk</th>
<th>Meat &amp; Beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
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<tr>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

3. After a coin is tossed, the starting team will choose a category and point amount from one food group (ex: Fruits for 300).
4. The team that chooses the question will have 15 seconds to answer. If they do not answer the question in 15 seconds, the other team will have a chance to answer the same question.
5. Answer the question correctly and the points will be added to the team score, but an incorrect answer will cause a deduction in points. The students may use their Nutritional Knowledge folders to help answer questions.
6. To answer, members of the team must raise their hands and wait to be called on. Any answers shouted out will not be considered for the question, so they will not receive points even if the answer is correct.
7. The winning team will receive a nutrition related sticker.
MyPyramid for Kids Jeopardy

Questions

Grains

100 – Fill in the blank. Make half of your grains ______.
   *Whole

200 – Give an example of grain we should eat every day.
   *Wheat/ whole wheat bread, rice, cereal, etc.

300 – What acts like a sponge in our bodies?
   *Fiber

400 – Fill in the blank. Grains give us ______ to do daily activities.
   *Energy

500 – How many ounces of grains do we need every day?
   *6 oz.

Vegetables

100 – Name a leafy, green vegetable.
   *Lettuce, spinach, etc.

200 – Name an orange vegetable.
   *Carrots, sweet potato, etc.

300 – How many cups of vegetables do we need every day?
   *1 1/2 cups

400 – What forms can vegetables come in?
   *Cooked, raw, frozen, fresh

500 – Are French fries a healthy vegetable?
   *No

Fruits

100 – Name a purple fruit.
   *Grapes, plum, etc.
200 – Name a citrus fruit with a lot of Vitamin C.
   *Orange, grapefruit, etc.

300 – How many cups of fruit do we need every day?
   *2 1/2 cups

400 – The colorful fruits contain the most ______.
   a. Energy
   b. Flavor
   c. Vitamins and Minerals *

500 – What forms can fruits come in?
   *Fresh, frozen, canned

**Milk**

100 – Name the nutrient found in milk that’s good for your bones.
   *Calcium

200 – How many cups of calcium-rich foods do you need every day?
   *3 cups

300 – Name a food in the milk group that we should not eat a lot of.
   *Ice cream

400 – Is cheese a part of the milk group?
   *Yes

500 – Getting physical activity for at least ______ minutes every day is important.
   a. 20 min
   b. 45 min
   c. 60 min *

**Meat and Beans**

100 – You need ______ ounces of meat and beans every day.
   *5 oz.

200 – Protein in meat and beans helps our muscles get ______.
   *Strong

300 – Name a type of meat found in this group.
   *Chicken, beef, etc.
400 – Name a type of bean that is found in the meat and beans group.
   *Kidney

500 – Which food choice is healthier? Baked or fried fish?
   *Baked fish
Lesson 4: Sanitation Measures Introduction

The act of hand washing is an essential daily practice due to the hands being exposed to disease-causing microorganisms and bacteria. Having clean hands and surfaces helps to protect against diseases such as the common cold, influenza (the flu), and the stomach flu. Germs can be spread among individuals or from surface contact by not washing the hands before touching their eyes, nose or mouth. The Centers for Disease Control and Prevention (CDC) notes that effective hand washing is one of the most important measures that can be taken against the spread of germs. Steps to achieve effective hand washing are provided by the CDC.

1. Wet hands with clean running water and apply soap. Use warm water that is comfortable, not burning the skin.
2. Rub hands together to make a soapy lather and scrub all surfaces (palms, under nails, in between fingers).
3. Continue rubbing hands for 20 seconds. Imagine singing "Happy Birthday" twice through
4. Rinse hands well under running water.
5. Dry your hands using a paper towel or air dryer. If possible, use your paper towel to turn off the faucet.

Numerous studies have been conducted to determine the occurrence of bacteria in the classroom. Results showed that water fountains, pencil sharpeners, computer keyboards, and restroom faucet handles were the most contaminated with bacteria. Student desktops, restroom faucet handles, and paper towel dispensers/electric hand dryers were the most contaminated with viruses. Some viruses and bacteria can live from 20 minutes to two hours or more on such surfaces, leading to the incidence of infection
and student absences. Improved classroom hygiene may reduce bacteria and virus contamination.

**Additional Resources:**

http://www.cdc.gov/cleanhands/
http://www.stmaryhealthcare.org/body.cfm?id=555953
http://jsn.sagepub.com/cgi/content/abstract/26/1/33?rss=1
LESSON 4: Sanitation Measures

Learning Objectives:

- Students will recognize the importance of hand washing through practice
- Students will understand the development of bacteria and why surfaces need to be kept clean, especially with food

Supplies Needed:

- Fight Bac “Scrub club” hand washing poster
- Food Safety crossword puzzle (can be used as supplemental lesson material)
- Germ Glow economy kit available at www.GermJuice.com - $21.90 for an 8oz bottle and a 6in., 4 watt black light
- Purel hand sanitizer (keep in the classroom)
- Students’ Nutritional Knowledge folders

Prior to Session:

- Review the Lesson 4 Introduction
- Xerox copy the Fight Bac “Scrub Club” hand washing poster (need one for each student)
- If a sink is not available in the classroom, arrange for students to practice hand washing a sink accessible to everyone
- Divide the class into three groups
  - Group 1 – Wash hands with soap
  - Group 2 – Rinse hands with water only
  - Group 3 – Do not wash or rinse hands

During the Session (Teacher Will):

1. Ask the student what they think germs are, and explain what they are, where they can be found, who has them, and how we can get rid of them.
2. Have Group 1 go to the sink and wash their hands with soap. Explain to the class that we need to spend time washing our hands, so we can either say our ABC’s or sing the Happy Birthday song twice. Then proceed with Group 2 going to the sink to only rinse their hands.
   **DURATION: 10 MINUTES**
3. While following the instructions included in the Germ Glow economy kit, have each group come to the sink to receive a small amount of solution for their hands.
Using the included black light have each group come up to the front of the class and show the difference in germ amount whether or not hands are washed.

**DURATION: 15 MINUTES**

4. Give each student a Fight Bac “Scrub Club” hand washing poster. Using the poster, review each step explaining to the students that they have just practiced about hand washing. You can incorporate questions into the poster review, such as asking students when they think they should wash their hands or how long should they spend washing their hands.

**DURATION: 5 MINUTES**

5. After the hand washing exercise is complete, and reviewing the Fight Bac “Scrub Club” hand washing poster have the students place it in their Nutritional Knowledge folders.

6. It may be helpful to keep a Fight Bac “Scrub Club” poster near the sink as a reminder for students (if sink is located in classroom)

** Be sure to carefully read and follow the instructions of the Germ Glow economy kit **

Students Will:

- Review the Fight Bac “Scrub Club” hand washing poster and practice washing their hands at the classroom or an available sink using the Germ Glow Solution

**Supplemental Material – As an easy way to quiz the students (possibly in a few weeks) about what they remember from this lesson, the Food Safety crossword puzzle can be utilized.**

Germ Juice® Economy Kit (www.germjuice.com)

Kit includes: (1) 8oz Bottle Germ Juice™
(1) 6 inch 4watt Pocket Black Light
Instructional information

Item Name: Germ Juice Economy Kit
Item Number: GERMJUICEECONOMY
Price: $21.90

To be used under adult supervision only! Above products are very safe and non-toxic, but safety while using these products should be followed. Never allow students to use if they have cuts, sores, skin conditions, dry skin, or prone to allergies or various
allergic reactions. Keep away from mouth and eyes. Avoid getting on clothing, can cause permanent staining. For best results always shake well. Obtain permission from parents when training children. Never allow anyone to look directly into ANY light, which this includes our long wave UV lights which are considered safe if avoiding looking directly into light.

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Be Smart. Keep Foods Apart.
Don't Cross-Contaminate

Right now there may be an invisible enemy ready to strike. He's called BAC (bacteria) and he can make you sick. But you have the power to Fight BAC! Be Smart. Keep Foods Apart—Don't Cross-Contaminate!

Check out the ways you can Fight BAC!

Wash your hands with soap and warm water:

• before you make or eat a snack or meal;
• after playing with pets; and
• after using the bathroom.

Remind grown-ups to always keep raw meat, poultry, and seafood apart from other foods. Don't let their juices drip on other foods.

Always use a clean plate when you help in the kitchen. Don't put cooked foods on plates that held raw meat, poultry, eggs, and seafood.

Use hot, soapy water to wash cutting boards, dishes, cooking utensils, and counter tops, especially after they come in contact with raw meat, poultry, eggs, and seafood.

Don't forget to help with the cleanup by using hot, soapy water and paper towels or clean cloths to wipe up kitchen surfaces or spills.

Kids, complete this puzzle to see how much you learned about fighting BAC!

Across

4. Use hot, soapy water to wash ______ utensils.
5. Always use a clean ______

Down

1. Don't let raw ______ drip on other foods.
2. Wash your hands with warm water and ______.
3. Use hot, soapy water and paper towels to wipe up ______ surfaces.
4. Always keep raw meat, seafood, and ______ apart from other foods.

International Food Safety Council
Cook It Safely

- Keep food safe from bacteria.
- You can't see, smell, or taste bacteria, but they can be on and in your food and make you sick.
- Cooking your food destroys the bacteria.
- Bacteria grow rapidly in the "Danger Zone", the temperatures between 40 °F and 140 °F.
- Take your food’s temperature by using a food thermometer.
- Make sure your thermometer is clean. Wash it after every time you take a temperature.
- A hamburger’s temperature should be 160 °F.
- Make sure your leftovers are safe. Reheat them to 165 °F.
- Be sure sauces, soups, and gravies come to a boil.
- Let food sit for a few minutes after cooking in a microwave.
- For food safety, keep hot foods hot.

Across

5. Make sure you clean it after every time you use it.

9. Sauces and soups need to come to a _ _ _ _ to be safe.

11. After being cooked in a _ _ _ _ _ _ _ _, allow food to sit for several minutes.

Down

1. Keep food _ _ _ _ from bacteria.

2. Keep hot foods _ _ _ _

3. _ _ _ _ your food to destroy bacteria.

4. Use a food thermometer to take your food’s _ _ _ _ _ _ _ _

6. Cook a _ _ _ _ _ _ _ to 160 °F.

7. You can’t see, smell, or taste them.

8. Not cooking food thoroughly can make you _ _ _ _

10. The temperatures between 40 °F

International Food Safety Council
The 6 Steps of Handwashing

**Step #1:** Wet your hands with warm water.

**Step #2:** Apply soap.

**Step #3:** Rub your hands together, and even get between those fingers for 20 seconds.

**Step #4:** Don’t forget your fingernails. Use a nailbrush if you have one.

**Step #5:** Rinse the germs away.

**Step #6:** Dry your hands.

Scrub Club™ and Scrub Club characters are copyright 2004 NSF International. “BAC” Character copyright 2004 The Partnership for Food Safety Education.
Lesson 5: Snacking/ Portion Sizes

Introduction

Nutrition fact panels, also known as food labels, act as a table of contents listing what nutrients are found in foods. It can help to increase the healthy nutrients that are needed by the body, like calcium and fiber, and limit nutrients that can be unhealthy, like saturated fat and sodium. The serving size and amount of servings per container listed on the nutrition facts panel is very important in knowing how many calories and other nutrients are being consumed.

Consuming oversized portions and underestimating how many calories are in foods are common ways that lead to overeating. To help avoid this, it is suggested to purchase single serving packages or remove a single serving from a larger package and don't eat out of the bag or box itself. Repackaging large bags or boxes of food into smaller, single serving packages can also be helpful.

Though most of nutrition fact panels are based on an adult diet, they can give children a general idea about what ingredients and nutrients can be found in their favorite foods, an adequate serving size to prevent overconsumption, and provide a way to compare food choices.
LESSON 5: Snacking & Portion Sizes

Overall Learning Objectives:
- Students will create a healthy snack while practicing portion sizing
- Students will learn how to choose healthy foods

Supplies Needed:
- Measuring Cups
- Trail Mix Ingredients (please refer to ingredients page)
- Small, zip top sandwich bags
- Recipe on index cards (previously prepared, will need to be cut out)
- Food Math worksheet
- Nutritional Knowledge folder

Prior to Lesson:
- Using two desks, set up food stations for each ingredient of the mix
- Place an index card at each station to indicate how much of an ingredient is needed
- Xerox copy the Food Math worksheet (need one for each student)
- Have students wash their hands

During the Lesson (Teacher Will):
1. Divide the class in half, so that one half makes the trail mix while the other half starts on the Food Math worksheet.
2. Give each student a Food Math worksheet, and review each with the class. By holding up the measuring cups, explain the difference in each to the students.
   **DURATION: 20-25 MINUTES** (between the two activities)
3. When the students are making the trail mix help to ensure that the portion sizes are correct.
4. Review the answers of the Food Math worksheet with the class, and instruct the students to place their completed work in their Nutritional Knowledge folder.

**DURATION: 5 MINUTES**

Students Will:

- Complete the Food Math worksheet either before or after making the healthy snack
- Practice the hand washing technique they learned during Lesson 4

**Trail Mix Recipe**

The following recipe should be utilized for students that may have a peanut and/or tree nut allergies. If children do suffer from this allergy please keep the ingredients of each recipe separate, use different measuring cup sets, have the ingredients set up on different desks, and indicate to the students why there are different recipes.

- **What You Need (Peanut and Tree nut Facility Free)**
  - 8.9 oz. box of Cheerios
  - 8 oz. bag of Sunsweet Jumbo Red from Flame Grapes Raisins
  - 16oz. box of Keebler Town House original crackers
  - Various Disney’s dried fruit pouches (apple, peach, strawberry/banana, and pear)
  - Same pretzels can be used as first recipe

- **Make It**
  - 1 cup of Cheerios
  - ½ cup of raisins
  - 5-6 crackers
  - ½ cup of Disney’s dried fruit
  - 1 cup of mini pretzels

Both trail mix recipes will use a box of 50 ct. Great Value sandwich bags
### Food Math

Jason is 9 years old. He’s physically active sometimes. Each day, he needs to eat:

<table>
<thead>
<tr>
<th>Grains</th>
<th>Vegetables</th>
<th>Fruit</th>
<th>Milk</th>
<th>Meat and Beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 ounces</td>
<td>2½ cups</td>
<td>½ cup</td>
<td>3 cups</td>
<td>5 ounces</td>
</tr>
</tbody>
</table>

Help Jason decide what to eat today. Plan breakfast, lunch, dinner, and a snack. Be sure he gets all the food he needs from each group. (Food items may be selected more than once.)

#### Grains 6 ounces
- 1 slice whole-wheat toast* (1 oz eq)
- 5 whole-wheat crackers* (1 oz eq)
- 1 slice white bread (1 oz eq)
- 1 slice whole-wheat bread* (1 oz eq)
- 1 cup whole-grain ready-to-eat breakfast cereal* (1 oz eq)
- ¾ cup cooked brown rice* (1 oz eq)
- 1 cup cooked pasta (2 oz eq)
- 1 hamburger bun (2 oz eq)
- 3 cups lowfat popcorn* (1 oz eq)

*Items marked with a * are whole-grain

#### Vegetables 2½ cups
- 6 baby carrots* (½ cup eq)
- 1 large ear of corn (1 cup eq)
- 1 medium baked potato (1 cup eq)
- 1 cup cooked greens* (1 cup eq)
- 1 large baked sweet potato* (1 cup eq)
- 3 spears broccoli* (1 cup eq)
- ⅓ cup tomato juice (½ cup eq)
- 1 cup chopped lettuce (¾ cup eq)

*Items marked with a * are dark green or orange vegetables

#### Fruits 1½ cups
- 1 small apple or ½ large apple (1 cup eq)
- 1 large orange (1 cup eq)
- 1 snack-sized container of peaches (½ cup eq)
- 1 large plum (¾ cup eq)
- 1 small box raisins (½ cup eq)
- 1 cup 100% orange juice (1 cup eq)
- 1 medium wedge cantaloupe (¼ cup eq)
- 1 small wedge watermelon (1 cup eq)

#### Milk 3 cups
- ½ cup lowfat or fat-free cottage cheese (¼ cup eq)
- 1 cup fat-free milk (1 cup eq)
- 1 snack-sized lowfat or fat-free yogurt (½ cup eq)
- 1 half-pint container 1% or 2% milk (1 cup eq)
- 2 ounces of lowfat or fat-free American cheese (1 cup eq)
- 1¾ ounces of lowfat or fat-free cheddar cheese (1 cup eq)
- 1½ cups light ice cream (1 cup eq)

#### Meat and Beans 5 ounces
- 1 ounce of nuts (2 oz eq)
- 1 cup split pea soup (2 oz eq)
- 1 small chicken breast half (2 oz eq)
- 1 small lean hamburger (2 oz eq)
- 1 hard-boiled egg (1 oz eq)
- 1 tablespoon peanut butter (1 oz eq)
- ⅛ cup of pinto beans (1 oz eq)
- 1 slice of turkey (1 oz eq)

Key: (1 oz eq) means equals 1 ounce equivalent
Lessons 6-7: Vitamins & Minerals Introduction

Growth and development of the body is supported by vitamins and minerals. They are involved in various energy facilitating metabolic processes, and also help with tissue synthesis and repair. There are 13 vitamins, which can be either fat or water soluble, and 22 major and trace minerals (Antioxidants and Good Food Sources, 2010). Vitamins and minerals contain antioxidants, which are naturally occurring substances found in many foods that help to stabilize free radicals that can damage the body’s cells and can lead to cancer (Antioxidants and Cancer Prevention, 2004 and Russell & Rovere, 2009). While mainly abundant in fruit and vegetables, antioxidants can also be found in grains, meats, poultry and fish. Most commonly known antioxidants are beta-carotene, ascorbic acid (Vitamin C), Vitamin A, and Vitamin E (Russell & Rovere, 2009). The following table gives examples of foods that contain antioxidants:

<table>
<thead>
<tr>
<th>Table 1. - Antioxidants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta- Carotene</td>
</tr>
<tr>
<td>Orange, red, yellow, and green</td>
</tr>
<tr>
<td>vegetables and fruits: carrots,</td>
</tr>
<tr>
<td>apricots, red and yellow peppers, broccoli, spinach</td>
</tr>
<tr>
<td>Ascorbic Acid (Vitamin C)</td>
</tr>
<tr>
<td>Citrus fruits and dark green</td>
</tr>
<tr>
<td>vegetables: oranges, pink</td>
</tr>
<tr>
<td>grapefruit, tomatoes, asparagus,</td>
</tr>
<tr>
<td>green peppers</td>
</tr>
<tr>
<td>Vitamin A</td>
</tr>
<tr>
<td>Liver, eggs, dairy products, fish</td>
</tr>
<tr>
<td>Vitamin E</td>
</tr>
<tr>
<td>Vegetable oils, legumes, grains,</td>
</tr>
<tr>
<td>seeds and nuts: olive oil, corn</td>
</tr>
<tr>
<td>oil, soybean oil, beans, lentils,</td>
</tr>
<tr>
<td>whole grains, brown rice</td>
</tr>
</tbody>
</table>

(Antioxidants and Cancer Prevention, 2004 and Antioxidants and Good Food Sources, 2010)
LESSONS 6-7: Vitamins & Minerals

Overall Learning Objectives:

- Students will recognize and understand the important roles that vitamins and minerals play in nutrition
- Students will understand the recommended amounts of vitamins and minerals, and the dangers associated with over/under consumption

LESSON 6

Supplies Needed:

- Human Body worksheet
- Vitamin and Mineral Function handout
- Question/Prompt worksheet
- Chalkboard
- Chalk
- Nutritional Knowledge folders

Prior to Lesson:

- Xerox copy the Human Body worksheet
- Draw the outline of a human body on the chalkboard

During the Lesson (Teacher Will):

1. Draw a large human body outline on the chalkboard and give each student a blank Human Body worksheet.
2. Give each student a Vitamin and Mineral Function handout, then give brief explanations for the vitamins.
3. Ask questions or present prompts for students to identify the vitamin or food source (provided on the Question/Prompt worksheet)
4. With each question or prompt, call on a student to label the human body outline on the chalkboard. The rest of the class will label their worksheets.
   **DURATION: 25-30 MINUTES**
5. After completing the vitamin section of the lesson, have the students place their work in their Nutritional Knowledge folders.

Students Will:
1. Fill in the Human Body worksheet according to the questions, prompts, and vitamin/mineral names given on the Vitamin and Mineral Function handout

2. Fill in the outline of the human body on the chalkboard using the magnetic labels provided, if called on by the teacher
LESSON 7

Supplies Needed:

- Human Body Worksheet (same as Lesson 6)
- Vitamin and Mineral Function handout
- Nutritional Knowledge folders

Prior to Lesson:

- Redraw the outline of a human body on the chalkboard

During the Lesson (Teacher Will):

1. Using the Vitamin and Mineral Function handout brief explanations for the minerals.

2. Continue to engage students using the Questions/Prompts worksheet, asking questions or presenting prompts for students to identify the mineral or food source (provided on the Question/Prompt worksheet).

   **DURATION: 25-30 MINUTES**

3. Have the students place all of their completed work in their Nutritional Knowledge folders.

Students Will:

1. Perform the same tasks as for Lesson 6
LESSONS 6 & 7: Vitamins and Minerals Questions/Prompts

***Note - Remember to tell students that:
- There are multiple B Vitamins
- The consumption of Sodium should be limited
- Even though your body needs Magnesium and it is found in chocolate, it should be limited because the sugar in chocolate can cause cavities

<table>
<thead>
<tr>
<th>Vitamins</th>
<th>Questions / Prompts</th>
</tr>
</thead>
</table>
| A        | I am a vitamin that is good for your vision  
|          | In what foods can you find Vitamin A? |
| D        | You can absorb me from sunlight  
|          | Other than sunlight, where else can you get Vitamin D? |
| E        | I am your extraordinary bodyguard  
|          | Other than from the oil in mayonnaise, where can you find Vitamin E? |
| K        | I help your blood to clot when you get a cut or scratch  
|          | In what foods can you find Vitamin K? |
| C        | I am your colorful bodyguard  
|          | In what fruits can you find Vitamin C? |
| B’s      | With all my many parts, I give you the energy to stay focused in (INSERT TEACHER’S NAME)’s class  
|          | In what foods can you find the B Vitamins? |

<table>
<thead>
<tr>
<th>Minerals</th>
<th>Prompts</th>
</tr>
</thead>
</table>
| Calcium  | Along with Vitamin D, I help your teeth and bones stay strong  
|          | I am a mineral found in milk and broccoli |
| Potassium / Sodium | Together we control the fluid balance in your body  
|          | You can find me in bananas  
|          | I am in just about everything that you eat, especially fast foods  
|          | I am a mineral also known as salt |
| Magnesium| Other than the B Vitamins, I help to provide energy  
|          | I am in the chocolate bars that you love to eat |
| Iron     | I am a mineral found in your blood  
|          | You can find me in fish and spinach |
### LESSON 6

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Function</th>
<th>Food Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Helps with healthy eyes, skin, and hair</td>
<td>Carrots, Spinach, Cantaloupe</td>
</tr>
<tr>
<td>D</td>
<td>Gives us strong teeth and bones</td>
<td>Milk, Fish, Sunlight</td>
</tr>
<tr>
<td>E</td>
<td>Our “bodyguard” that protects against tissue damage</td>
<td>Oil in mayo, Sunflower seeds</td>
</tr>
<tr>
<td>K</td>
<td>Blood Clotting</td>
<td>Spinach, Lettuce, Cauliflower</td>
</tr>
<tr>
<td>C</td>
<td>Our “bodyguard” that helps to heal wounds</td>
<td>Oranges, Strawberries, Broccoli</td>
</tr>
<tr>
<td>B’s</td>
<td>Provides us with energy</td>
<td>Milk, Spinach, Oranges, Chicken</td>
</tr>
</tbody>
</table>

### LESSON 7

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Function</th>
<th>Food Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>Gives us strong teeth and bones</td>
<td>Milk, Broccoli, Yogurt</td>
</tr>
<tr>
<td>Potassium</td>
<td>Helps with fluid balance, and muscle strength</td>
<td>Orange Juice, Bananas</td>
</tr>
<tr>
<td>Sodium (Salt)</td>
<td>Fluid Balance</td>
<td>Fast Foods</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Helps to make strong bones</td>
<td>Spinach, Dried Beans, Chocolate</td>
</tr>
<tr>
<td>Iron</td>
<td>Creates red blood cells, and helps our brains develop</td>
<td>Spinach, Beef, Leafy Green Veggies</td>
</tr>
</tbody>
</table>
Lesson 8: Beverages Introduction

Often for a child’s taste, the sweeter the food or drink, the better. The consumption of sugars and sweeteners has been on a steady increase in the U.S. High amounts of sugar consumption may lead to obesity, which can increase the risk of developing diabetes. Research has shown that excess amounts of sugar contribute to the body’s fat stores, just as any other high caloric food would (Sizer & Whitney, 2006). More children are being diagnosed with type 2 diabetes due to their weight because as the body increases fatty tissue so does the resistance of cells to insulin. Diabetes was almost unknown among children and young people ten years ago, but in some communities it is the children and young people who account for 50% of the new cases of diabetes (Wechsler, McKenna, Lee, & Dietz, 2004).

Not only does high consumption of sugars have an influence on weight-related diseases, it can also be a cause of cavities for children. Bacteria in the mouth lives off of the sugar found in majority of juices and soda, which can cause tooth decay and ultimately dental caries (Sizer & Whitney, 2006). This harmful bacteria is able to produce acid up to 30 minutes after the teeth have been exposed to sugar, and damages enamel (Sizer & Whitney, 2006).

The negative effects of sugar to one’s health, whether from food or drink, can be decreased through moderation. Sugar is ultimately an energy source for the body to be stored as glycogen, so nutrition studies do not recommend avoiding sugars all together.
LESSON 8: Beverages

Learning Objectives:

- Students will classify the beverage choices that contribute to and damage a healthy body
- Students will identify healthy beverage choices using the information learned from Session 5 and food label examples

Supplies Needed:

1. What Does the Label Say worksheet
2. Nutrition Facts Panel handout
3. Large Ziploc freezer bags filled with sugar (3) – (already prepared)
4. Nutritional Knowledge folder

Prior to Lesson:

- Xerox copy the What Does the Label Say worksheet and Nutrition Facts Panel handout (need one for each student)

During the Lesson (Teacher Will):

1. Pass the sugar filled Ziploc bags around the classroom, so the students will be able to see the difference in sugar amounts between soda, juice (Capri Sun pouch), and 2% milk.

   **DURATION: 10-15 MINUTES**

2. As students look at the Ziploc bags, explain why sugar can be bad for one’s health.

3. Give each student a What Does the Label Say worksheet and Nutrition Facts Panel handout, and have them complete the worksheet then place it in their Nutritional Knowledge folder.

   **DURATION: 15-20 MINUTES**
Students Will:

1. Complete the questions on the What Does the Label Say worksheet using the Nutrition Facts Panel handout.
What Does The Label Say?

Before you eat something, read the nutrition label. It shows important information that can help you make healthier food and drink choices. Read the following labels. Then use them to answer the questions.

**Coca Cola**

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size 1 Can</td>
</tr>
<tr>
<td>Amount Per Serving</td>
</tr>
<tr>
<td>Calories 140</td>
</tr>
<tr>
<td>Total Fat 0g</td>
</tr>
<tr>
<td>Sodium 50 mg</td>
</tr>
<tr>
<td>Total Carb 39g</td>
</tr>
<tr>
<td>Sugars 39g</td>
</tr>
<tr>
<td>Protein 0g</td>
</tr>
</tbody>
</table>

Ingredients: Carbonated Water, High Fructose Corn Syrup, Caramel Color

**Skim Milk**

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving size 1 Carton</td>
</tr>
<tr>
<td>Amount Per Serving</td>
</tr>
</tbody>
</table>
| Calories 90 | Calories from Fat 0%

<table>
<thead>
<tr>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat 0g</td>
</tr>
<tr>
<td>Saturated Fat 0g</td>
</tr>
<tr>
<td>Trans Fat 0g</td>
</tr>
<tr>
<td>Cholesterol 5mg</td>
</tr>
<tr>
<td>Sodium 130 mg</td>
</tr>
<tr>
<td>Total Carb 13g</td>
</tr>
<tr>
<td>Dietary Fiber 0g</td>
</tr>
<tr>
<td>Sugars 12g</td>
</tr>
<tr>
<td>Protein 8g</td>
</tr>
</tbody>
</table>

Ingredients: Fat Free Milk, Vitamin A, Vitamin D

1. Find the serving size for each. How many servings are in the coca cola and skim milk?

2. The energy you get from food and drinks are measured in calories. How many calories are in the coca cola? How many are in the milk?

3. Calcium helps your teeth and bones to grow, how much calcium in the coca cola? How about the milk?

4. Food is made up of nutrients. Nutrients help your body to work and grow. For example, vitamin A helps keep your skin and hair healthy. Is there vitamin A in the coca cola or milk? If there is, how much vitamin A is in these drinks?

5. Find the list of ingredients. The main ingredient is listed first. What is the main ingredient in the coca cola? What about the milk?

6. Which do you think is healthier? Why?
**Nutrition Facts Panel Handout**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Start here</td>
</tr>
<tr>
<td>2</td>
<td>Check calories</td>
</tr>
<tr>
<td>3</td>
<td>Limit these nutrients</td>
</tr>
<tr>
<td>4</td>
<td>Get enough of these nutrients</td>
</tr>
<tr>
<td>5</td>
<td>Footnote</td>
</tr>
<tr>
<td>6</td>
<td>Quick guide to % daily value</td>
</tr>
</tbody>
</table>

### Nutrition Facts

**Macaroni & Cheese**

- **Serving Size:** 1 cup (228g)
- **Servings Per Container:** 2

**Amount Per Serving**

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Amount</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Total Fat</td>
<td>12g</td>
<td>18%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>3g</td>
<td>15%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>3g</td>
<td>20%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>30mg</td>
<td>10%</td>
</tr>
<tr>
<td>Sodium</td>
<td>470mg</td>
<td>20%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>31g</td>
<td>10%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>5g</td>
<td></td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>5g</td>
<td>4%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Vitamin C</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>4%</td>
<td></td>
</tr>
</tbody>
</table>

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Calories:</th>
<th>2,000</th>
<th>2,600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>Less than 65g</td>
<td>65g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>Less than 20g</td>
<td>20g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less than 300mg</td>
<td>300mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>Less than 2,400mg</td>
<td>2,400mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>300g</td>
<td>375g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>25g</td>
<td>30g</td>
</tr>
</tbody>
</table>
Lessons 9-10: Fast Food Introduction

Children tend to increase body fat due to foods which contain high amounts of fats, carbohydrates, sodium, and calories. The fact that there are excessive amounts of nutrients in fast food accounts for the risk of weight gain that children face when they consume these foods. Children are becoming a major market force for multiple advertising techniques, such as television advertising, in-school marketing, and toy products with brand logos. While children do not understand that media is being utilized to market various food products, there are few policies and standards regarding advertising. The Children’s Advertising Review Unit (CARU) of the National Council of Better Business Bureaus has no authority over advertisers and can only ask for voluntary compliance (Story & French, 2004). Parents have become the targets for fast food price advertising because energy dense foods, such as French fries, are more convenient to purchase rather than preparing a home cooked meal.

Dr. Lisa Young, a nutritionist at New York University, has noted that portion sizes have increased over the past 20 years and “super-sizing has pervaded every segment of the food industry” (Brownlee, 2002). As children continue to grow in a world fueled by various factors that affect their dietary intake, they begin to assume that these unhealthy eating behaviors are the norm.

A regular consumption of fast food does not promote proper nutritional growth and development. Teaching children about a limited consumption of fast food, and how
to read and understand the nutrition facts of a fast food restaurant could influence them to make healthier eating choices and focus on achieving a more balanced diet.
LESSONS 9-10: Fast Food

Overall Learning Objectives:

- Students will understand that eating away from the home should be limited
- Students will identify healthy, alternative choices when eating away from the home

LESSON 9

Learning Objectives:

- Students will demonstrate an understanding of addition, subtraction, multiplication, and division by solving problems using data from nutrition charts
- Students will discuss the calories and grams of fat recommended for their age group

Supplies Needed:

- McDonalds Nutrition Facts handout
- Understanding the Facts worksheet
- Create-A-Meal worksheet and example handout
- Highlighters
- Rulers
- Nutritional Knowledge folders

Homework – Using the same McDonalds Nutrition Facts handout from class, students will choose foods for breakfast, lunch, dinner, and two snacks in order to create their own menus during the next session according to recommendations for their age group. Students will also complete Question 5 on the Understanding the Facts worksheet.

Prior to Session:

- Xerox copy the McDonalds Nutrition Facts handout and Understanding the Facts worksheet (need one for each student)

During the Lesson (Teacher Will):

1. Give each student a Nutrition Facts handout and Understanding the Facts worksheet.
2. Go over the directions with the students, explaining that the rulers and highlighters can be used to help them to find the food items specified in the Understanding the facts worksheet.

**DURATION: 20-25 MINUTES**

3. Review the answers to the Understanding the Facts worksheet with the students, and have them place their completed work in their Nutritional Knowledge folders.

**DURATION: 5-10 MINUTES**

4. Give each student a Create-A-Meal example handout and explain what the students will be doing as homework for the Lesson 10.

**DURATION: 5-10 MINUTES**

5. Have the students place all worksheets and handouts in their Nutritional Knowledge folders.

Students Will:

- Complete the questions on the Understanding the Facts worksheet utilizing the McDonalds Nutrition Facts handout

**Homework – Using the same McDonalds Nutrition Facts handout from class, Create-A-Meal example handout, and Creating a Balanced Diet at a Fast Food Restaurant worksheet students will choose foods for breakfast, lunch, dinner, and two snacks in order to create their own menus during the next lesson according to recommendations for their age group. Students can refer to their completed Food Math worksheets (from Lesson 5) for help.**
LESSON 10

Learning Objectives:

- Students will select healthy food from a fast food menu
- Students will create a menu based on the MyPyramid for Kids recommendations

Supplies Needed:

- Creating a Balanced Diet at a Fast Food Restaurant worksheet (from Lesson 9)
- Create-A-Meal example handout (from Lesson 9)
- Construction Paper (different colors)
- Glue Sticks
- Scissors
- Hole Puncher
- Yarn
- Rulers
- Markers /colored pencils / crayons
- Nutritional Knowledge folders

Prior to Session:

- Set up the art supplies at the front of the classroom

During the Lesson (Teacher Will):

1. Using the foods chosen on the Creating a Balanced Diet at a Fast Food Restaurant worksheet, have the students use the art supplies to make a menu. Menus should include the food item, and the amount of calories, total fat grams, and saturated fat grams. Allow the students to be creative when making their menus.

   **DURATION: 30-40 MINUTES**

2. Hang the students’ menus in the classroom for display.

3. All worksheets can be places in the students’ Nutritional Knowledge folders.
Students Will:

1. Utilize the art supplies provided to make menus of the healthy foods chosen from the McDonalds Nutrition Facts handout, while identifying the amount of nutrients of each food.
Name:__________________

Directions:
Using the McDonald’s nutrition facts handout, perform the following duties and answer the following questions.

1. Find the number of calories and fat content (in grams) of a regular hamburger.

2. Which sandwich has the least amount of fat grams?

3. Calculate the combined value of calories and fat content (in grams) of a regular hamburger, small French fries, and a small Coca Cola drink.

   Hamburger: 250 calories, 9 grams of fat
   Fries: 230 calories, 11 grams of fat
   Coca Cola: 150 calories, 0 grams of fat

4. Find the item on the McDonald’s menu that has the greatest amount of calories and fat. What is it? How many calories and grams of fat are in it? How much saturated fat is in it?

5. Premium Caesar Salad with Grilled Chicken – VS – Premium Chicken Club Sandwich
   Find the difference in calories and fat content (in grams) for the food items.

   Salad: 220 calories, 6 grams of fat
   Sandwich: 650 calories, 22 grams of fat
Try not to get more than:
- 1800 calories
- 60 grams of fat
- 20 grams of saturated fat

<table>
<thead>
<tr>
<th>Meal Items</th>
<th>Calories</th>
<th>Total Fat Grams</th>
<th>Saturated Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakfast</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egg McMuffin</td>
<td>300</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Small orange Juice</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lunch</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian Salad with Grilled Chicken</td>
<td>300</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Newman’s Own low-fat balsamic vinegar</td>
<td>40</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Apple dippers</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit and yogurt parfait without granola</td>
<td>130</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Dinner</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premium Chicken Classic (grilled)</td>
<td>420</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Snack size fruit and walnut salad</td>
<td>210</td>
<td>8</td>
<td>1.5</td>
</tr>
<tr>
<td>Newman’s Own low-fat sesame ginger dressing</td>
<td>90</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Iced tea unsweetened</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanilla reduced fat ice cream cone</td>
<td>150</td>
<td>3.5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>1815</td>
<td>51 grams</td>
<td>12.5 grams</td>
</tr>
</tbody>
</table>
Creating a Balanced Diet at a Fast Food Restaurant

1. Try not to get more than:
   - 1800 calories
   - 60 grams of fat
   - 20 grams of saturated fat

2. When you done add up the columns where it says **Totals**

<table>
<thead>
<tr>
<th>Meal Items</th>
<th>Calories</th>
<th>Total Fat</th>
<th>Saturated Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thank you so much for your participation in the READY, SET, LEARN curriculum project! This day will be used to thank the students for all of their hard work that will help other children in the fight against childhood obesity.

Questions that can be asked to get an idea of how the students enjoyed the project are:

1. What were your favorite lesson(s)?
2. Do you plan to continue to use what you’ve learned?
3. Would you like for us to come back?
4. What didn’t you like about this project?
APPENDIX D

Name: ______________________________________

READY, SET, LEARN: Portage County 3rd Grade Nutrition Education Curriculum (Pre/Mid/Post-Assessment)

Directions: Answer the questions to the best of your ability; this worksheet will not be graded.

1. What food group or groups can spaghetti with sauce and meatballs belong to? (Check □ Grains □ Vegetables □ Milk □ Meat & Beans □ Fruit

2. Identify the following food items.
   • I am a green vegetable that looks like a tree
     ________________________________
   • I am a long, yellow food in the fruit group. If you turn me a certain way I look like 😊
     ________________________________

3. Are French fries a vegetable?

4. When is it important to wash your hands?

5. Circle the healthiest snack.
   • Milk and cookies
   • Potato Chips
   • Celery and Peanut Butter or Cream Cheese

6. Which vitamin or mineral am I?
   “I am also known as salt.”
7. Match each vitamin or mineral to what it does in the body.

<table>
<thead>
<tr>
<th>Vitamin A</th>
<th>Gives us healthy teeth and bones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>Bodyguard that helps to heal wounds</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Helps with our hair, skin, and eyes</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Gives us healthy teeth and bones</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Provides our bodies with energy</td>
</tr>
</tbody>
</table>

8. Which beverage has more sugar in it, milk or soda?

9. True or False. It is ok to eat a McDonald’s cheeseburger, fries, and milkshake every day.

10. What is your favorite food? Which of the 5 food groups does your favorite food fall in?
APPENDIX E

READY, SET, LEARN: Portage County 3rd Grade Nutrition Education Curriculum

1. Overall, did you like the nutrition education curriculum program? Circle a number, 1-5, answering if you did not like the program or really liked it.

<table>
<thead>
<tr>
<th>(Did not like)</th>
<th>(It was ok)</th>
<th>(Really Liked)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

2. What was your favorite lesson in the program?

3. What was your least favorite lesson in the program?

4. Would you like to continue learning about nutrition? Circle a number, 1-5, answering if you would not, may want to, or would like to continue learning about good nutrition.

<table>
<thead>
<tr>
<th>(No)</th>
<th>(Maybe)</th>
<th>(Yes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
# NUTRITION EDUCATION CURRICULUM SURVEY

For each question below, circle the number to the right that best fits your opinion on the importance of the issue. Use the scale above to match your opinion.

<table>
<thead>
<tr>
<th>Question</th>
<th>Scale of Agreeance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel pressured to focus majority of classroom curriculum on standardized testing needs.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>The amount of time I dedicate in my lesson plan to core subjects (Mathematics, English, Science, etc.) is the same amount of time dedicated for health and nutrition education.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Given the prevalence of the childhood obesity epidemic, more time needs to be reserved for nutrition education.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>I consider childhood overweight and obesity as a growing problem in schools.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>I am qualified to teach nutrition education.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>I enjoy teaching nutrition education curriculum.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>I am provided with the necessary supplies to teach nutrition education curriculum.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Students respond positively to the current nutrition education curriculum being used.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Students would enjoy hands on, interactive nutrition education learning experiences.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>It is important to inform parents about the nutrition education curriculum being taught in the classroom.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
I would like to use a manual of previously prepared nutrition education curriculum.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why?</th>
</tr>
</thead>
</table>

The top three sources that I use to develop nutrition education curriculum are:

- MyPyramid.gov
- Nutrition Expedition program
- Library books (used for supplemental information)

I would like for someone to come in the classroom to teach nutrition education curriculum.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why?</th>
</tr>
</thead>
</table>

An example of what I teach as nutrition education curriculum is:

Last year I taught 12 lessons using information that I found using the MyPyramid website and the Nutrition Expedition program that featured Little D the dinosaur.

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Scale of Agreeance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness of information provided by lesson introductions.</td>
<td>1 2 3 4 5 X</td>
</tr>
<tr>
<td>Layout and format of the lessons.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Content of the lessons.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Grade and age appropriateness of the lesson content.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Overall judgment of the program.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

Additional Comments:
I wasn’t able to download all of the attachments for the lessons, including some of the introductions. The students were overwhelmed with the McDonalds menu lesson and the labeling lesson because they have not learned percentages yet.