

Think before you eat!
A Kindergarten Nutrition Unit

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Overview

The intention of the unit, “Think Before You Eat!” is to encourage students to think about what they are going to eat, while making the connection that what we eat promotes being healthy. Health literacy is presented across the curriculum to kindergarten students by integrating reading, writing and math lessons. The aim is to provide students with food experiences that are tasty and prepared in the classroom along with their peers. Nutrition lessons will look at food groups, the USDA food pyramid, graphing food preferences and food preparation. Students will become more aware of the need for eating fruits and vegetables daily. The focus of the lessons is on how important eating “5 a day” is to keeping their bodies strong and well. Exercise sessions will be incorporated throughout the unit to help the students understand the body’s requirements for health maintenance and growth.

This unit is designed to heighten awareness of the nutritional needs of kindergarten students. By increasing their consumption of fruits and vegetables students will decrease their reliance on fatty and sodium drenched snack alternatives (such as chips and cookies). The food preparation lessons are laid out in a sequential order so that ultimately young students can perform these tasks with minimal adult supervision. These activities can be done in a typical practical life curriculum in a primary or kindergarten Montessori classroom, as well as in a traditional kindergarten classroom. The secondary lessons embedded in the activities portion are designed to help students construct their understanding that fruits are nature’s storehouses full of vitamins and minerals. By counting the seeds and performing the graphing activities, students will take on the elemental tasks of becoming data collectors. Foreshadowing the work that is to come in later years of their education provides students a scaffold for learning (Vygotsky, 1978). By undertaking these activities students will enrich their store of general and background knowledge.

Rationale

In the past thirty years the number of overweight children has doubled. 1 in 5 children in the U.S. are overweight (Lancet, 2002). African American and Latino children aged 6 to 11 are more likely to be overweight than white children of the same age. Diets low in fruits and vegetables and higher in fat are linked to childhood obesity. Less time spent on physical activities such as sports reduce energy expenditure which increases the risk factors for obesity. (www.obesity.org/information/childhood_overweight).

Inactivity trends in children are, in part, causing obesity rates to rise. The television viewing habits of U.S. 6 to 11-year-olds, coupled with the consumption of fatty foods and the lack of exercise, are among the predictors of obesity later in life. Obesity in children increases in children who watch more hours of television (Crespo,2001). Children who watch TV for 3 hours per day are 50% more likely to become obese than children who watch fewer than 2 hours per day (Tremblay, 2003). The detrimental health effects of watching too much television during childhood persists into adulthood (Obesity Research, 2008). Schools have cutback on physical education classes. According to the National School Health Policies and Programs Study, only 8% of today's school children are receiving physical education classes (CDC, 2000)

The stigma of obesity in childhood has many psychological and psychosocial ramifications. The stigmatization of overweight children promotes negative attitudes that affect their peer relations and activities. Harassment from peers at school includes teasing, name-calling, insults, and ridicule. Some overweight students experience weight stigma by accepting the negative attitudes toward themselves (Latner, JD, 2003). Overweight students can become vulnerable to low self esteem, depression, low self concept and higher risk of eating disorders (Banis H.T., 1998).Peer perception of overweight children in classroom environments results in low peer acceptance. In general, overweight children are more socially withdrawn. Peers perceive overweight classmates as less physically attractive, less athletic, more sick, tired, more aggressive and absent from school (Zeller,Reiter-Purtill, Ramey Obesity, 2008).

Being overweight during childhood puts pressure on the body's ability to control blood sugar. Type 2 diabetes is preventable. Thirty years ago, Type 2 diabetes was diagnosed after age forty. It is now found in all ages including children and adolescents. Type 2 is linked to diet and inactivity. High blood sugar levels sustained over a long period of time can cause heart disease, strokes, blindness and kidney failure(Obesity, 2008).

A review of school based obesity prevention programs by the National Schools Health Policies and Program Study suggests that social based learning programs are more efficacious for girls. For boys, interventions that allow them to be physically active throughout the program are more effective (Kropski, Keckley, Jenson , Obesity,2008). Due to these factors, the unit described in "Think before you eat!" allows for a great deal of purposeful movement coupled with social engagement.

Presenting nutritionally related activities and information to kindergarten students and asking their parents to reflect on healthy eating patterns, while increasing their daily exercise, will promote better academic outcomes for students. Studies have stated that students aged 2 to 9 across the U.S. need to improve the quality of their diets (www.cnpp.usda.gov). The consumption of fruits and vegetables declines as children approach 7 years of age. (USDA, Nutritional Insights, 2001). Kindergarten students usually turn 6 years old during the school year so it comes at a good time in their lives to be introduced to health literacy lessons.

The practical life curriculum in a Montessori classroom is a rich collection of activities that are designed to teach children purposeful, real life skills. Children learn how to independently accomplish tasks in the classroom that are commonly done for them by helpful adults at home and in most school settings. The lessons taught in this portion of the Montessori curriculum facilitate the development of simple skills that have many direct applications to food preparation, such as, pouring, measuring, transferring dry and wet ingredients to different sized vessels, to name a few. Some of the benefits children derive from mastering independent practical life activities are problem solving, self-control, development of fine motor control, lengthening of their concentration span and increasing capacity to focus attention (Lillard Stoll,A., 2005).

Certain self- help skills that underpin this unit, and essential aspects of any Montessori classroom, are care of the classroom and care of self. Teaching children how to wash their hands properly and clean up after cooking is essential to helping children learn the basics of food preparation which, in turn, sets the stage for healthy eating. Children exposed to experiences that require active engagement are given the opportunity to construct their knowledge contextually instead of merely forming associations. Meaningful context is a powerful tool in constructing understanding (Bransford et al, 1999: Kuhn, 2001: Peterson, Fenneman, Carpenter&Leof, 1989), hence making is essential for all phases of education. Kindergarten is an ideal time for nutrition education as it is the beginning of formal education.

Obesity in the United States has become an alarming health crisis with serious, life long consequences. The Surgeon General issued a statement in 2001 that sounded the alarm by stating an estimated 61% of U.S. adults and 13% of children and adolescents are obese. Furthermore, this report states that only 3% of Americans eat the recommended daily grain, dairy, meat, vegetable and fruit requirements illustrated by the food pyramid. 40% of American adults engage in no leisure time physical exercise at all (www.surgeongeneral.gov/topics/obesity/calltoaction/fact.htm). Adult lifestyle and obesity patterns have impacted upon children, who are responding in kind to their adult role models and life style choices. Childhood obesity was elevated to epidemic status by the American Medical Association in 2001(www.jama.ama-assn.org).

The increasing weight of young children aged 3 to 7 years old coincides with the time when most children are becoming adjusted to formal school settings. Young children at this tender age are learning how to become compliant and pro- social. Also how to extend their concentration spans to take in early, foundational, pre-academic and academic skills. Many urban schools do not have the gym facilities or the recess time required to curb the paucity of exercise.

A bleak picture emerges from the literature. Children are not getting enough exercise (60 minutes per day for optimal health) at school or home. Our kids are

becoming much like the adults that surround them. There are serious health risks for the developing child that are associated with not exercising, eating improperly, and not getting 5 portions of fruit or vegetables a day.

An overweight child is more likely to have asthma, high blood pressure, sleep apnea, type 2 diabetes or gallstones than a child of average weight (www.surgeongeneral.gov/topics/obesity). The early onset of menses in the overweight female population has risen over the past decade. Unfortunately, some of these overweight girls are barely 10 years old, or younger, which can lead to endocrine issues later in life (American Obesity Association, 2007). Overweight has become a very serious public health crisis.

Food preferences and choices can be subject to many influences. Family and culture are powerful determinants regarding what we choose to eat. Our culture affects the ways in which we nurture. Food and love are highly connected experiences. Informed choices regarding nutrition and health consciousness can make eating healthy choices more delicious, enriching and fun. “Think before you eat!” is intended to encourage children to consider options that are healthy and prepared in a social context. Children will try new food items at school and participate in making food where there is no pressure placed upon them to eat what they already do not like. By widening a child’s food preferences, and educating them about the food they eat, an awareness of how we shape ourselves by what we eat will emerge. Popular food choices in U.S. children are typically ones that embody “sweetness” and “familiarity”. Children choose foods aligned with the choices of their eating companions (Birch, 1987). The many overweight children we see today in our culture run serious health and emotional risks.

The decline of diet quality for children aged 2 through 9 years of age has many researchers concerned (Institute of Health, 1991). For example, 36% of U.S. children between 4 and 6 years of age need to improve their nutritional quality. The decline in diet quality is linked to a significant decline in fruit, vegetable, and sodium consumption. (USDA Center for Nutrition Policy and Promotion, 2001). According to the Healthy Eating Index children from 7 to 9 years of age are consuming more salty, snack foods and fast foods while their consumption of vegetable and meat plummets. (www.cnpp.usda.gov).

Nutrition information

Throughout the tasting experiences, the students will benefit from learning health information. The need for eating more fruits and vegetables in their daily diet will be discussed throughout the unit. Included in these discussions will be the nutritional benefits of fruits and vegetables, the need for fiber and the vitamin and mineral enriched components of healthy eating. The notion that there are many delicious healthy food alternatives to the processed snack foods found in the corner store may help steer students away from unhealthy snacking.

The following information was obtained from the USDA database for Standard Reference (2007).

Foods	Total Calories	Fat (g)	Vit.A (IU)	Vit.C (mg)	Calcium (mg)	Iron (mg)	Sodium (mg)
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Vegetables

Carrot (medium)		0.027	601	4.2	24	0.22	50
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Celery (1 stalk)	8	0.01	120	5	20	0.20	63
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Romaine (3.5oz.)	15	0					
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Sugar snap Peas (1 cup)		0.025	34	37.8	27	1.31	3
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Fruits

Apple (medium)	81	0.5	74	8	10	0.25	1
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Red Bell Pepper		0.032	187	152	8	0.51	5
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Cantaloupe 1/8		0.002	117	25.3	6	0.14	11
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Honeydew 1/8		0.048	4	22.5	8	0.21	22
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Watermelon 1/16		0.046	80	23.2	20	0.69	3
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Cucumber (medium)		0.026	8	6.4	8	0.44	4
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Additional nutrition information is included below to emphasize the need for key vitamins, and minerals in a healthy diet. The notion that what we eat has an impact on our health can be introduced to young children as they begin to develop eating habits that will last a lifetime.

Nutrition at a glance:

(The information on this list can be found at: <http://causes of.org/vitamins-a.htm>)

Key Nutrient

	Function	Deficiency
<u>Fat Soluble</u>		
Vitamin A	Helps keep skin smooth. Helps keep mucous membranes firm and resistant to infection. Necessary for proper vision.	Night blindness. Lowered resistance to infection. Dry, rough, itching skin.
<u>Water Soluble</u>		
Vitamin C	Needed for synthesis of collagen, the cementing material that holds together body cells. Helps body resist infection. Strengthens blood vessels. Helps heal wounds and broken bones. Keeps gums healthy	Scurvy characterized by listlessness, fleeting pains in legs and joints, small hemorrhages under skin, bleeding gums. Lower resistance to disease.
<u>Minerals</u>		
Calcium	Bone and tooth formation. Blood clotting. Muscle contraction and relaxation.	Rickets and poor growth
Iron	Serves as a constituent of haem, a part of the haemoglobin molecule.	Anemia, fatigue, and listlessness.
Sodium	Maintains fluid balance in body (osmotic pressure).	Weakness, fainting.

Parent questionnaire

This questionnaire is provided as a way to raise awareness about nutrition. Eating 5 fruits and vegetables per day, embodied in the slogan “eat 5 a day”, has permeated the airways and has become part of the public lexicon. However, as childhood obesity rates rise, it is clear that the message has not yet hit home. Teachers have a unique vantage point in our society. Teacher’s capacity to make an important impact upon student academic outcomes is at the heart of the teaching practice. Teachers can and do influence students in a variety of ways. Providing curriculum that emphasizes good nutrition and exercise can reduce the risk of childhood obesity. The questionnaire is an opportunity for parents to consider what their child is learning about nutrition and exercise at school. It may be a way for parents to consider these things at home as well.

Parents are the child's first teacher. Shaping behavior is a conscious and sometimes unconscious part of the parenting process. The questionnaire is presented as a self-reflection tool for parents. It can have the side benefit of opening up conversation about nutrition and the need for exercise. As their child becomes more informed about nutrition and thinking before they eat, parents may want to include more fruits and vegetables. This questionnaire does not need to be returned to the teacher.

Parent Questionnaire:

1. I feel successful about my efforts by including 5 fruits and vegetables in my child's daily diet.

Strongly Disagree	Disagree	Agree	Strongly agree
1.	2.	3.	4.

2. I know my child eats 5 a day.

Strongly Disagree	Disagree	Agree	Strongly agree
1.	2.	3.	4.

3. I talk with my child about nutrition and healthy choices.

Strongly Disagree	Disagree	Agree	Strongly agree
1.	2.	3.	4.

4. I would like information on childhood nutrition and healthy snacking.

Strongly Disagree	Disagree	Agree	Strongly agree
1.	2.	3.	4.

5. My child gets 60 minutes of exercise every day.

Strongly Disagree	Disagree	Agree	Strongly agree
1.	2.	3.	4.

Objectives

The PA standards that are addressed in the unit activities are in science, math and literacy areas of the Philadelphia school district's core curriculum. The science standards are "Basic Human Needs: 3.8A Science, Technology" and "Human Endeavors. 4.8.4A Humans and the Environment" and "4.3.4C Environmental Health". These science standards are fleshed out by using activities that relate to fruits, vegetables, vitamins, proteins and fiber as being part of a healthy diet. The "Healthful Living Standard, 10.2.3", and "Concepts of Health 10.1.3" are addressed by familiarizing the students with our basic nutritional needs.

By using labels for the plastic food replicas, students will be exposed to the literacy standards 1.1E and 1.1F "Learning to Read Independently". Each of the food experiences will begin by making a KWL chart to assess prior knowledge about nutrition and food names. Supplementary duplicate matching cards that illustrate the fruits and vegetables will have a control of error built in. i.e. the cards with pictures will have the name of the food item printed on the bottom of the card on one set of cards whilst the other set will have only the picture. The students will have a group of separate labels to match.

The PA Mathematics Standards "2.4A Mathematical Reasoning and Connections" are addressed in all of the various activities. The students will have the opportunity to count the seeds, graph the numbers and make associations to the weights of the fruit and their seed count. Standard 2.11 "Numbers, Number Systems and Number Relationships" will also be used in the activities.

To link the idea of healthy eating and the value of exercise during this week -long unit, the students will be introduced to physical activities throughout literacy and math lessons. In the literacy block, verbs will be focused upon. Verbs that are commonly used in the Rigby series in reading levels A, B, C, and D will be featured and performed by students. Using movements such as hopping, running in place, and skipping while counting to 100 are sample activities. Teaching children how to check their pulse rate before and after these exercises is an opportunity for children to discover how their bodies work. Through experience with exercise embedded into academic lessons, children may make the connection that exercise has a positive effect on their well being and readiness to work on learning tasks.

The proposed unit is based on providing kindergarten children with opportunities to learn about healthy food choices and preparation. By exposing these 5 and 6 year olds to healthy foods and food preparation experiences, the intent is to actively engage them in learning to make more nutritionally informed food choices. The students will be introduced to the USDA food pyramid by constructing it using a 3-D model along with realistic 3-D replicas of various foods. The students will have a concrete experience with constructing a healthy diet.

Tasting and exploring the uses of common fruits and vegetables, and learning what nutritional value they hold, will be the core of the unit. Some examples of the food explorations will be apples, carrots, cucumbers, lettuce, and peppers in salad making and also various melons. Preparing food provides an ideal backdrop for discussing healthy

eating. The emphasis on the five-a-day program and exposure to eating experiences from plant-based choices provides a vehicle for development of good, life-long, eating habits.

In addition to nutrition lessons, this unit will also focus on exercise. Students will learn to check their resting pulse rate and compare it to their active pulse rate. The importance of aerobic exercise as a way to curb childhood obesity and enhance a child's overall health cannot be ignored. Students who are quite young can be empowered to understand and learn how to impact their own wellness by exercising. Having a structured exercise segment of the day may help the children focus better and attend to lessons while giving their bodies the exercise they need. Using a Simon says game format for ten minutes three times per day, will engage the students in aerobic exercise. Taking their pulse rate before and after exercise will help the students learn how exercise makes their hearts work harder when they are active. Students will also go on walks to a local fruit and vegetable stand. Pre- and post- exercise pulse checks will be part of these experiences.

The third phase of the unit addresses parent information and education. By fully acknowledging that parents are adult learners, information about serving sizes and healthful foods that comprise a healthy diet can be shared. The aim is to assist parents to get a closer look at the nutritional value of what their children are eating over a week's time. At the end of the week, the parents will be presented with the recommended daily foods and exercise needs for children aged 4 to 6.

Strategies

The journal portion of the unit can be used effectively once the students are familiar with "writer's workshop". The habit of writing in a journal should be well established. The beginning of the second marking period may be ideal as students have become familiar with many sight words and have had exposure to guided reading and graphing activities in the math core curriculum. Many of the food tasting experiences can be used in the first marking period as a preview and introduction to food preparation and exposure to healthy food choices. The exercise activities can be introduced in the first marking period and continue throughout the year. Health literacy can be addressed throughout the year by incorporating a food preparation area in the classroom to be used at center time.

Alongside the food preparation activities, a model of the USDA food pyramid will also be constructed. The use of the Food Pyramid for Young Children (USDA, 2005). The children will have access to food replicas and learn the proper placement of these foods, according to the USDA daily food intake recommendations for their age group. The use of a Plexiglas pyramid that has shelves built in to hold the replicas would allow the children to vividly see where the USDA nutritional values are placed according to healthy consumption priorities. A nutrition word wall and journal writing activities will help to accomplish the objectives of the core literacy curriculum. The agricultural history of the different ingredients used in this unit will provide a platform where the information shared with urban students about how foods are grown will help students connect what they know about eating to where it comes from. Recommendations for farm visits in our area will be provided for teachers who would like to go on field trips to observe planting and harvest.

As a service to the parents of kindergarten students, a questionnaire is provided. This questionnaire is not required to be handed in to the teacher, but rather used as a way for parents to self-check on the nutritional relevance of their child's eating habits. Two of the items on the questionnaire pertain to the amount of exercise their child is currently getting outside of school. This is planned as a way for parents to draw their own conclusions about the link between exercise and healthy eating habits. Information from the USDA regarding childhood nutrition pertinent to the Kindergarten age group will be available to parents as well.

Nutritional values, historical perspectives of foods and how food items are cultivated, will be highlighted in the exploration of food choices with the children. Students will label, sort and match food replicas with the words. A sensorial approach will begin once real food items are introduced, prepared and tasted. By using their senses the children will identify food preferences and will be better able to describe them - hence building their nutrition and health vocabularies. The children will hone their observational skills by identifying similarities and differences. Each food tasting will culminate in a graphing activity.

Classroom Activities:

Lesson One: Building the food pyramid

Objectives:

- *Students will classify and sort food replicas according to food categories (dairy, meat, fats, fruits and vegetables).
- *Words related to foods and their meanings will be presented.
- *Discussion about foods that are nutritious and about USDA recommendations for foods to be eaten daily and those that ought only to be eaten sometimes.
- *Writing in nutritional journal.

Content: PA Standards

Math

2.4A Mathematical Reasoning and Connections

2.11 Numbers, Number Systems and Number Relationships

Health

10.1.3 Concepts of Health

10.2.3 Healthful Living

Literacy 1.3A Reading Analyzing and interpreting literature

1.6B Speaking and Listening

1.5A Quality of Writing

Science

3.8A Science, Technology and Human Endeavors

4.3.4C Environmental Health

4.8.4A Humans and Environments

Procedure:

Using plastic replicas of foods from each food group the students will assemble the food pyramid. A clear Plexiglas pyramid will be used and children will sort the replicas onto the various shelves and place labels onto the replicas which graphically demonstrate the USDA requirements. When the replicas and labels have been placed in the food categories, the students will be given a printed blank pyramid. They will draw pictures and label the foods that they prefer on their pyramid. This page will constitute their first entry in their nutrition journal. If students are unable to draw the item, a picture can be cut out of magazines or provided by the teacher and affixed onto the pyramid along with the printed words.

Lesson Two:

Exercise

Finding a fruit and vegetable stand or store that carries healthy alternatives to snack food that is close to the child's school is ideal. There is such a place within walking distance of our school. It is only one block away but most students live in a local housing project that is located in the opposite direction from the school. By using the local business, the students will be exposed to an easily identifiable source of alternative healthy snacks. The other reason for using this store is that it will provide the students with additional exercise, which will be recorded in their journals. The students will be shown how to find their resting pulse before we embark on the walk to the fruit and vegetable stand, before each of the food preparation experiences. While we are walking the students will be asked how their pulse is different from the resting pulse. When we return to school they will check their pulse after exercise to note the difference. Notes about the walk to and from the fruit and vegetable store, and what they saw there, will be a focus of journal entries.

Objectives:

- *Students will learn how to find their pulse points.
- *Students will learn about their need for exercise to keep their bodies strong and healthy.
- *Students will learn about the difference between resting pulse and how it changes after exercise.
- *Students will reflect on how they feel before and after exercise.
- *Students will make notes in their nutrition journals about the walk to the produce store.

PA standards:

10.1.3 Concepts of Health

4.8.4A Humans and the Environment

10.2.3 Healthful living

Procedure:

Demonstrating how to find a pulse on one's neck using the pointer and middle fingers, the students will identify the location of the major blood vessel that supplies blood to the brain. Once the student finds their pulse the teacher explains that we will do this before, during and after the walk to the fruit and vegetable stand. What we want to know is if there are differences they can feel, talk, and write about.

A simple explanation of the science of aerobic exercise might contain pertinent facts that a kindergarten child can understand and use. Present to the students the notion that in order for your body to remain healthy, you must do some work called exercise. Exercises like walking makes your lungs, heart and blood vessels work harder. This work helps your body grow and makes everything flow better and more air exchange makes your insides feel stronger. The heart is a muscle that works for you every second, every hour and day of your life. Walking helps your heart to stay strong and by walking more you are giving your body a present everyday.

Lesson 2: Apple Tasting

Objectives:

Throughout the food activities, the students are asked to use their senses and articulate what they like about the different foods. They are to be encouraged to look at the fruit carefully before cutting it, smell the fruit to determine the scent it gives, determine if they have had a fruit like it before. Making notations and illustrations in their nutrition journal will make the learning more concrete.

A KWL chart activity will be helpful before each tasting experience is initiated in order to help the students get a feel for what they already know about a fruit's flavor, scent, usefulness and why it is good for our health. Recording the words used in their descriptions will go on a fruit and vegetable word wall chart for future reference.

- * Students will use their senses to identify, classify, taste and record their flavor preferences.
- * Students will have an opportunity to note their preferences on a graph.
- * Students will compare their preferences with their peers on the bar graph.
- * Students will write in their nutrition journal recording their observations.

Content PA Standards:

Literacy

1.3A Reading, Analyzing and Interpreting literature.

1.6B Speaking and listening

1.5A Quality of writing

Science

3.8A Science, Technology and Human Endeavors

4.3.4C Environmental Health

4.8.4A Humans and Environment

Materials needed:

Four types of apples: Gala, Macintosh, Red Delicious, and Granny Smith

Sliced lemons to retard oxidation of cut apples

Cutting boards for each group

Small knives (used by teacher)

Apple coring tools for each group

Paper plate for each child

Trays for serving

Damp sponges for each group

Bowl or pail for refuse
Aprons
Graphing grid
Colored pencils
Nutrition journals

Procedure:

Divide the class into four groups (or less if you have a small class). At each group's table place the cutting board, 4 types of apples, trays, sponges. The teacher will demonstrate to the students how to use the apple-coring tool for slicing the apples.

Starting with the Red Delicious, the students will make a drawing of that type of apple in the assigned spot on the grid. A prediction of how many seeds might be in each apple is recorded on the prediction portion of the page placed in the nutrition journal by the teacher. When the drawing and prediction is completed, children will have the chance to slice the Red Delicious apple. A quick squeeze of lemon will keep the fruit from oxidizing and remain visually appealing. Each of the children will taste a piece and make a note of how many seeds are in the slice and write a smiley face or a frown or a neutral face below the picture indicating if it tasted pleasing, or not.

As each child takes a turn slicing the other types of apples, the children make an additional picture on the grid and correspondingly make the smile neutral or frown to indicate their preferences. Each of the apple slices, and their number of seeds, are tallied - both slices and total number of seeds in each apple is recorded. This procedure continues until all of the apple types are consumed and preferences and seed tallies are completed.

Cleaning up the cores, cutting boards and trays will be each student group's responsibility. Time taken for these tasks is essential for the students as their feeling of providing useful service to their small group community is important.

When recording is completed, the students will be asked to record their findings on one large graph that will show which apple most children preferred. A review of the count of the seeds in each one will also be recorded. A determination of which apple contains the largest number of seeds will be determined and recorded.

The children will record an illustration of what they did in their nutrition journal. On the top of their page, the teacher will place prepared strips that have the headings "How many seeds are in the apples we tasted?" and "Which apple has the most seeds?" The students will be asked to draw the apples they tasted, include the number of seeds and circle the ones they enjoyed the most. This procedure will become the culminating event for each of the food experiences.

Lesson Three: Salad Making

Objectives:

Students will:

- *Collaborate by being a member of a team by making a salad cooperatively.
- *Learn the nutritional values of the vegetables used in the salad.
- *Graph their flavor preferences by using senses to identify, classify, taste and record.
- *Students will compare their preferences with peers.
- *Students will write in their nutrition journals recoding their observations.

Key Questions-

How are fruits and vegetables different?

Do you get the same vitamins and minerals from fruits and vegetables?

Why do you think these vegetables have so few seeds when you compare them to the melons and apples?

PA Standards:

Health

10.1.3 Concepts of Health

10.2.3 Healthful Living

Math

2.4A Mathematical Reasoning and Connections

2.11 Numbers, Number Systems and Number Relationships

Literacy

1.1E Learning to read independently

1.1F Learning to read independently

Science

10.1.3 Concepts of Health

Materials:

4 heads of Romaine lettuce

8 red peppers

1 pound of snap peas

1 head of celery

1 package of carrots

8 cucumbers

Cutting boards for each table

Vegetable peelers

Cutting tools (safety Wavey Knives are preferred)

Damp sponges

Trays for serving

Large salad bowl

Bowls or pails for refuse

Brush for cleaning vegetables

Water pitcher and basins for the lettuce

Towels to be placed under basins

Washcloths for drying the leaves or paper towels

For the dressing:

Whisk

Bowl

Olive oil

Lemon

Sea salt and pepper

The graphing pictures can be made on the grid prior to the food preparation activity as the students have had exposure to this part of the experience from the apple tasting event. Due to the wet nature of the lettuce and cucumber it may be prudent to put the graphing work aside, or tape it to the blackboard or wall so as not to create a mess. Cleaning the vegetables prior to the event would be wise, as the students may not have the skills necessary for a complete cleaning.

Careful demonstration is required to teach young children how to safely peel carrots and cucumbers. If volunteers are present, please ask them to allow the students to work on mastering how to handle a vegetable peeler rather than doing the peeling for them. Knowing the proper use of cutting and peeling tools provides an important learning opportunity for children.

Each child has a turn lightly scrubbing cucumbers and carrots. Using a Wavey Knife, the ends of the carrot and cucumber will be sliced away. The ends will be discarded in a pail or bowl. The peeler is used with care taken that the peeler moves away from the body from the wider end of the carrot to its tip. All peelings will be discarded when the vegetable is peeled. Using the Wavey Knife to slice, holding firm to the base of the carrot with a downward stroke the carrot slices should be made thin enough for an appealing salad. The same procedure is helpful for the cucumbers. As the sliced pieces are prepared, they will place into a salad bowl. After this part is done, each student should taste what he or she have prepared and make a note of what they like on the grid.

Romaine lettuce grows best in sandy soil. Due to its superior nutritional value, it is used in this food experience. There will be a bit more mess but it will be worth it in taste and crunch. Each student will need to get a few romaine lettuce leaves. Take time for the students to notice the shape, look and texture of the leaf. The students will need to wash their leaves so that the sand falls from it. When the leaves have been sufficiently washed, apply a dry cloth or paper towel to the leaves and gently dry them. The students will tear the leaves and add the torn leaves into the salad bowl. Another option is to use a salad spinner to release excess water.

Cutting the snap pea end manually and pulling the strings along the top may provide a point of interest for the children. While cutting open the red pepper and seeing the membrane and its multiple seeds may provide food for thought. How is it possible that so many seeds can be clustered together? Are the snap peas inside their edible pods really seeds? Noting how many seeds in all of the red peppers may be too overwhelming a task, picking one should suffice.

When all the vegetables are in the large salad bowl the task of making the dressing begins. In a bowl will go scant one quarter cup of olive oil, a fourth cup of balsamic vinegar or lemon juice, sea salt and pepper to taste. The dressing is then whisked and applied to the salad. After it is tossed, the salad is plated and the class eats a vegetable feast.

When the salad is done, clean up will commence. When the students are ready to share their ideas about their preferences, a large graph identifying who likes what part of the salad most will be revealed. Writing in their nutrition journal about the experience of making and eating the salad is a good follow up activity. Encouraging students to include making illustrations of all of the vegetables they had in the salad is a way of creating a

record of food experiences shared by the classroom community. Making note of similarities and differences between the vegetables should be noted. Children can make a circle around the ones they liked the best.

Lesson Four: Melon Tasting

Objectives:

Students will:

- *Prepare melons for tasting and sharing with classmates.
- *Count the number of seeds in each melon group
- *Compare and contrast the number of total seeds in each of the melons
- *Record the data in nutrition journals
- *Identify descriptive words and flavor terms from the word wall.

Key Questions-

How are the seeds different in the honeydew, sugar melon, and the cantaloupe?

Is the sweetness different when we compare the three melons?

How are the three melons the same?

Do the melons smell different when we compare them?

How does the rind look on all three? How are they the same and how do they differ?

Content: PA Standards

Health

10.1.3 Concepts of Health

10.2.3 Healthful Living

Literacy

1.6B Speaking and Listening

1.5A Quality of Writing

Science

3.8A Science, Technology and Human Endeavors

4.3.4C Environmental Health

4.8.4A Humans and Environments

Materials:

Cantaloupes

Sugar watermelons

Honeydew melons

Cutting boards

Bowl for seeds

Bowl or pail for refuse

Damp sponges

Wavey Melon Slicers for each table

Paper plate for each child

Procedure:

Preparing for the melon slicing and eating, the KWL chart and accompanying word wall is prepared. These devices help the children become ready for the intellectual tasks ahead. Children may have had many experiences of eating melons at home so they will present their prior knowledge of the various melons. Supporting their learning through the idea of objectifying and noting what they experience validates the importance of collecting data. The use of the nutrition journal and word wall helps students locate words that are helpful for spelling and literacy learning. Therefore, prior to the experience itself, the students draw a picture of the three fruits and how they look from the outside skin.

The students commence with the slicing of the cantaloupe. Placing the cantaloupe firmly on the cutting board, the slicer is placed directly on top of the melon. Pressure is applied in a downward direction and the melon is laid open in lovely slices. Each child is asked to take a slice and count how many seeds they find in their slice. By doing this step, the students will be removing the seeds and membranes from the cantaloupe. A tally of how many seeds were found in each cantaloupe will be added to the information set for data collection and graphing. The total number of seeds for each cantaloupe will be noted as well. After eating the cantaloupe, children make a note of their taste preference. Once this information is recorded, the surface will be cleared and a damp sponge applied.

Prior to the sugar watermelon slicing, reflection on the number of seeds counted in the cantaloupe is advisable. A prediction of how many more or less seeds there might be in the watermelon. Determining the weight of the melon and comparing the weight of the cantaloupes used in the other tasting experience will bring into the discussion many possible predictions. For example, does the weight of the fruit mean that there will be more seeds or more fruit? Identifying where the seeds are located in a watermelon might generate interesting ideas for speculation, as well. Noting their thoughts on what these similarities and differences will be written in the nutrition journals.

The small sugar watermelon is placed on the cutting board. The slicer is placed firmly on the top of the melon. A downward pressure is applied to the melon and viola! The melon slices are revealed in all their red and black seeded glory. Because of the nature of watermelon slices, one must eat the fruit and slip the seeds on a paper plate for counting. The total number of seeds on each plate is assessed and a total tallied up for each table. The students will check their prediction against their actual count. At end, the students mark the data in their notebooks along with a drawing of the seeds and the interior of the watermelon slices. Any new words included are noted on the word wall and inside their notebooks.

The honeydew melon experience follows the others in terms of procedure. A drawing of the melon begins the notebook entry along with the name Honeydew Tasting. A KWL chart is constructed to assess what the students have remembered about the other melon experiences and the data that has been recorded is reviewed. Determine the weight of each of the honeydew melons and making sure that each has been recorded. Any new words that the children have decided to record on the word wall embedded in their notebook describing the color, shape, sound made when flicking the side of the melon, smell, smoothness of the rind, etc.

Place the honeydew firmly on the cutting board. Place the Wavey slicer on the top of the melon and apply pressure in a downward motion revealing the lime green interior of this voluptuous fruit. Children will make a picture of the interior of the honeydew melon slice, its seeds and membranes. The students are asked to remove the seeds from the membranes of their slice; counting the seeds and placing the membranes in a bowl for refuse. After slicing the honeydew, the students eat their slices. Students will compare how many seeds they have in their melon slices and come to a total for the table. A comparison will be made about how many seeds there were in each of the melons. A determination of whether the weight of the melon helped them with their prediction about the number of seeds.

Extension Activities:

An additional set of food experiences are noted below. Children are introduced to information about the processed foods they have come to know.

1. Take a bag of potato chips and place them inside a brown paper lunch bag. Crush the chips inside the bag and set it aside. The fat from the chips will begin to become visible within an hour or two. Left overnight the fat from the chips will saturate the bag. Using the nutrition journal to make notations before and after the experiment allows the students to make predictions and make a note of the results.

2. A dramatic experience for students to witness is how many teaspoons of sugar are in a can of cola. Take a teaspoon and scoop out 16 teaspoons of sugar pouring them one on top of the next into a sugary pyramid onto a piece of black satin or black velvet. Pour them ceremoniously for added effect. An average can of cola contains approximately 16 teaspoons of sugar. Ask the students if they think this may be a bit too much sugar to digest? The nutrition journal can be useful in this experiment for prediction and result.

3. An interesting experiment for the children to observe is how powerfully corrosive a can of cola can be. Pour two cans of soda into a jar (an empty mayonnaise jar is good for this). Place a tarnished penny in it and tightly seal up the jar. Discover how long it takes for the penny to become shiny. The acid from the soda acts as a cleaning agent. The nutrition journal can be useful here too as most children have no idea how much acid is in carbonated cola.

4. Making raisins is surprisingly easy and interesting for kindergarten students. A sunny window is essential for this to be successful. Take a few bunches of grapes and run them under cold water. The grapes are gently pulled from the vine and each dried carefully. A paper towel is placed on a screen, which is held up by bricks on either side to allow airflow under the grapes. A paper towel or sheet of cheesecloth is placed on top of the grapes to avoid dust to settle into the crevices of the raisin. Allow them to sit in the sun for 4 to 5 days. Occasionally turn the grapes over as they shrivel. Nutrition journal illustrations can be taken on a daily basis.

Useful Websites for Parents:

*American Dietetic Association (ADA)- Information on locating a nutritional professionals and subsequent dietary recommendations are available and can be downloaded at www.eatright.org/Public.

*Feeding Kids Newsletter by Connie Evers, M.S. RD- Promotes nutritional health and provides nutritional information and related activities to assist in teaching children and adolescents. www.nutritionforkids.com.

*My Pyramid- 2005 10M. A report on Preventing Childhood Obesity.
www.iom.edu/projectasp?id=25044.

*Centers for Disease Control and Prevention (CDC)- Information provided on a variety of health related topics, i.e. nutrition, physical activity, food safety, etc. Also on coordinated health programs at school.

www.cdc.gov/

[www.cdc.gov/Healthy Youth](http://www.cdc.gov/HealthyYouth)

www.cdc.gov/nccdphp/dnpa/physical/recommendations/young.htm

*United States Department of Agriculture (USDA) Child nutrition Programs- Information on the USDA Child Nutrition Programs including National School Lunch and School Breakfast Programs, Child and Adult Care Food Programs, Summer Food Service Program, and After School Snack Program.

<http://schoolmeals.nal.usda.gov/>

*United States Food and Drug Administration (FDA)- Information on dietary supplements, food borne illnesses, mad cow disease, West Nile virus, product recalls, in addition to several other food related and drug-related topics.

www.fda.gov/

Annotated Bibliography For Teachers

Chandler, Lynda E. Fruits and Vegetables Coloring Book. Dover Publications, Inc. Mineola, New York.2001.

* Contained in these pages are the flowering plant, the fruit or vegetable in its whole state and a cross section of the fruit or vegetable are depicted. The illustrations are well rendered and a brief history, and where the produce was first developed, is included. This book is applicable for students K through 12.

Pallotta, Jerry.Thomson,Bob.Stewart, Edgar.The Victory Garden Vegetable Alphabet Book.Charlesbridge Publishing, Watertown, MA.1992.

*The illustrations in this book are wonderful. The information on the growing of each of the vegetables, locations in the U.S. where they are grown and some history of the origins of the vegetables are highlighted. This book is applicable for students K through 12.

Cheung, Lilian, W.Y., Gortmaker, Steven,L., Dart, Hank.Eat Well & Keep Moving An Interdisciplinary Curriculum for Teaching Upper Elementary School Nutrition and Physical Activity. Human Kenetics. Champaign, IL. 2001.

* This is an excellent, award winning, resource for teachers in planning curriculum focusing on the healthy habits of exercise and eating fruits and vegetables. This curriculum provides teachers with a wealth of information about nutrition written in clear concise language. There are many activities that are excellent for grades 3 to 6.

Pollan, Michael. The Botany of Desire. A plant's-eye view of the world. Random House, New York (2001).

* Pollan writes a vivid, historic, political piece on four elements that people seek: sweetness, beauty, intoxication and control. His chapters on apples and potatoes are of real interest due to the treatment he applies to the historic and modern techniques of propagation.

Pollan, Michael. The Omnivore's Dilemma A History of Four Meals. Penguin Books, London, England. (2007).

* Pollan once again delivers a fine description of the historical and modern cultivation processes, marketing and the food industries that support crops and livestock. The thought of "what to have for dinner?" takes on new meaning.

Schneider, Elizabeth. The Essential Reference Vegetables from Amaranth to Zucchini. Harper Collins Publishing Inc. New York, N.Y. 2001.

*This is a valuable reference guide of 350 vegetables from seed to mature plant. Recipes are suggested for each vegetable and excellent full color photographs of each help you identify varieties that may surprise the reader.

Katzen, Mollie. Honest Pretzels. Tricycle Press, Berkeley, CA. 1999.

* Katzen, the writer of Moosewood Cookbook, has written a cook book that is written for children aged 8 to 16. Her illustrations are whimsical and the steps to preparing many great meals that kids will eat are well laid out.

McGee, Harold. On Food and Cooking The science and lore of the Kitchen Revised and Updated. Scribner, New York, N.Y. 2004.

* McGee presents an invaluable and indispensable text that outlines quite clearly the chemistry of the foods we eat. Professional chefs and home cooks can get their fill of “molecular gastronomy”.

Murray, Michael, Pizzorno, J., Pizzorno, L. The Encyclopedia of Healing Foods. Atria Books, New York, N.Y. (2005).

* This is an interesting resource book for those who reflect on the adage “you are what you eat”. The health consequences and benefits of food are outlined in an effort to assist one in designing a safe, healthy and healing diet. The health benefits, nutritional highlights, history, and tips for preparing a wide variety of foods are presented.

Cook, Deanna, F. The Kids’ Multicultural Cookbook Food&Fun Around The World. Williamson Publishing, Charlott, Vermont. 1999

*This book is ideal for preparing foods from a wide variety of cultures. It is a great addition to the social studies and world cultures portion of the core curriculum. Interesting facts about world cultures are included in this great recipe book.
Annotated Bibliography for children

Ryan, Munoz, P. How Do You Raise A Raisin? Charlesbridge, 2004.

* If you would like your students to grow raisins, here is a great way to introduce the concept. Within are a wide amount of information about the grape and raisin crops and where you can find them grown.

Smallwood, Sally. Sweet as a strawberry. Anna McQuinn Publishers, London, England. 2002.

* This is a delightful picture book with great photographs and a small amount of text. A good book for early readers to read, or enjoy as a picture book.

Ehlert, Lois. Eating The Alphabet Fruits and Vegetables from A to Z. Harcourt, Inc. New York, NY 1989.

* This is an alphabet book of fruits and vegetables. The illustrations are fanciful water colors.

Lauber, Patricia. Who Eats What? Food chains and food webs. HarperCollins Publishers.1995.

* This is a book from the Let's-Read-And-Find-Out-Science series. It contains a lot of information on food chains and webs that is easily explained to children from K through 3 grade.

Krauss, Ruth. The Carrot Seed. Harper &Row Publisher.1945.

* A perennial classic, The Carrot seed depicts a young boy's need for patience as his carrot plant grows. Simple text makes this accessible to Kindergarten and first grade.

Faulkner, Megan. A Day at the Apple Orchard. Scholastic Inc. New York, NY.2005.

* Apple Picking, the different stages of development of the apple harvest and a great class trip are photographed and presented in this book. Reading this one after a class trip or before is ideal for first grade and kindergarten children.

Ribke, Simone,T. The Shapes We Eat. Children's Press, New York, NY.2004.

*The shapes of various familiar foods are depicted in these rookie readers. This is a great book for shared reading that will tie in math concepts and foods for kindergarten children.

McMillan, Bruce. Growing Colors. Harper Collins Publishing, New York, NY. 2005.

* Appetizing fruits and vegetables on the vine and tree are presented for students to associate the colors of these food choices they already know. Ideal for kindergarten.

Wilkes,Angela,Watt,Fiona. The Usborne Little Round The World Cookbook. London,England,2004.

*Recipes for fruits and vegetables indigenous to twenty seven cultures are presented in this small tome.

Goodwin,Mary,T.,Pollen,Gerry.1974. Creative Food Experiences for Children. Center for the Public Interest, Washington, D.C.

*Although this is an older text, it is a thoughtful and beautifully written guide for teachers to have in their collection of reference materials. Goodwin was a public health nutritionist who takes the reader on a journey about the science of food, its nutritional values and provides a cross curricular approach to sensible eating for children.

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Obesity Sites and references:

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<http://jama.ama-assn.org>

www.surgeongeneral.gov/topics/obesity

American Obesity Association <http://www.obesity.org>

www.obesity.org/information/weightbias

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