

The University of San Francisco  
**USF Scholarship: a digital repository @ Gleeson Library |  
Geschke Center**

---

Master's Projects and Capstones

Theses, Dissertations, Capstones and Projects

---

Fall 12-15-2017

# Prevention of Childhood Obesity and Diabetes

Karen Carig  
[kgcarig@dons.usfca.edu](mailto:kgcarig@dons.usfca.edu)

Follow this and additional works at: <https://repository.usfca.edu/capstone>

 Part of the [Other Immunology and Infectious Disease Commons](#)

---

## Recommended Citation

Carig, Karen, "Prevention of Childhood Obesity and Diabetes" (2017). *Master's Projects and Capstones*. 692.  
<https://repository.usfca.edu/capstone/692>

This Project/Capstone is brought to you for free and open access by the Theses, Dissertations, Capstones and Projects at USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. It has been accepted for inclusion in Master's Projects and Capstones by an authorized administrator of USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. For more information, please contact [repository@usfca.edu](mailto:repository@usfca.edu).

Karen Carig

Got Health? Stay Strong and Live Long Without Childhood Obesity and Diabetes

MPH Candidate 2017

University of San Francisco, California

Table of Contents.....2  
Introduction.....4  
Scope of Work.....4  
Impact.....7  
Conclusion.....15  
References.....16  
Appendices.....18  
    Figure 1.....20  
    Appendix A.....20  
    Appendix B.....21  
    Appendix C.....25

### **Abstract**

One of the public health concerns that have been on the rise is childhood obesity and diabetes. The National Health and Nutrition Examination Survey indicate that approximately one-third of children in the United States are overweight or obese with 17% meeting criteria for obesity (Pulgaron and Delamater, 2014). This crisis exists nationally and internationally which can effect children in the following ways: physically, socially, psychologically and mentally. Although, genetics also play a role in these diseases, environmental factors, lifestyle preferences and cultural environmental play have a major influence. My internship with the Food Education Project covers a better understanding to prevent these existing public health issues through education settings not only in classrooms, but for students to also bring home. The main tools that I utilize are lesson plans, preparing grant writings and food education preparations that could also take place when dining out with families and helping prepare food safely in the kitchen. The different lesson plans that were created include exercise friendly activity for children that will help encourage getting on the move, the different steps of handwashing, healthier choices when eating out and building a healthy plate. The purpose of my capstone is to discuss factors that influence childhood obesity and the different challenges that have yet to be addressed to prevent numbers from increasing.

## **I. Introduction**

The public health problem that I am addressing over the next couple of weeks is to educate students grades K-5<sup>th</sup> the topics of: health education, environment, food selections, nutrition and mental health. The epidemiological data that I will be addressing in my project will be reflected through research findings using charts and tables that pertain to childhood obesity and type 2 diabetes. The Food Education Project strongly believes that health begins at home and is emphasized at school. My goal during my fieldwork hours is to educate students the importance of how serious and fatal diabetes (type 1 and type 2) and obesity can be if not treated or cared for properly. We as a community can combat the numbers of obesity and diabetes through public health education.

We as a community in the Bay Area can combat the numbers of obesity and diabetes through public health education along with being persistent. Throughout the past couple of years, this has been addressed as a public health issue and the numbers continue to rise. Although the numbers remain, there are programs during and after school that are being developed to encourage children and adolescents to get moving not just physically but to also stay motivated. Nerud & Samra, 2017 cover the randomized controlled trial tested the “Make a Move” which is a Head Start parents aimed program to produces changes and implement more physical activity and healthy eating. The “Make a Move” intervention consisted of four sessions, with each session lasting 60 minutes each. They provided strong results of 27 eligible participants who completed the study and were included in the analysis. It is programs like “Make a Move” that is a great start of introducing exercise to prevent childhood diabetes and obesity.

The National Institute of Health (2017) defines obesity and overweight as an excess of body fat. They state that there is no consensus on a cutoff point for excess fatness of overweight or obesity in children and adolescents.

The World Health Organization (WHO) explains that the frequency of diabetes is rising around the world with studies showing children at increased risk of developing the disease. They state that, “over time, diabetes can damage the heart, blood vessels, eyes, kidneys and nerves which cause chronic problems and early death” WHO (n.d.). The basics of diabetes is that there are two types that exist. Type 1 diabetes is known to be insulin dependent which is when the pancreas does not produce enough insulin – which is what is regulating the blood sugar. Type 2, which is non-insulin dependent that is preventable by diet control, physical activity and life style changes. Unfortunately, type 2 diabetes has been increasing and much more reported in children and adolescents according to the World Health Organization.

Dehgan, Akhtar, Merchant (2005) find that childhood obesity has reached epidemic levels in developed countries. They state that twenty-five percent of children in the US are overweight and 11% of those are obese. Their findings of childhood obesity have been prevalent since 1971 where in some European countries such as Scandinavian countries show the prevalence of childhood obesity to be lower when comparing with Mediterranean countries. Their studies also find that the highest prevalence rates of childhood obesity have been observed in developed countries and particularly high in the Middle East, Central and Easter Europe.

It is not easy to deny that many things have worked around convenience when it comes to marketing and parents. Going to a drive-thru for cheaper foods will trump coming home after working not just one, but sometimes two jobs and still having to prepare a home-cooked meal from scratch. Of course it will be much easier to bring home a burger and fries for your family if

it means you can rest sooner than later. I believe that convenience is one of the current gaps that still exist in our society today. Not only is time a necessity when it comes to preparing a fresh and healthy meal but so does the cost of preparation. Unfortunately, most families find it challenging to prepare healthier meals at home with their children due to the lifestyle that has been incorporated in our society these days. For example, a typical mother and father who work an 8-5 schedule or even later, will still have to pick up their kids, make sure they do homework, and any other extra curriculum activities.

You might be wondering how we are able to successfully overcome this gap that still exists. One of the ways could be to possibly prepare meals ahead of time, alternate with your partner at home, allow the children in the household to get involved, creating a menu ahead of time for the week and limiting eating out on a weekly basis. Parents are usually the main target or focus of early childhood obesity prevention interventions. Previous studies (Skouteris, H., Morris, H., Cox, R., Edwards, S., Baur, L., Wolfenden, L., & Huang, T. 2017) have shown that childhood education is key in delivering obesity prevention strategies. It has been found that actively building young children's knowledge concept about healthy eating and sustainability using play-based learning has a reflection on groundbreaking opportunities for health and childhood education to work in partnership to generate health gains for young child. Skouteris et al., 2017 find children's interest in popular culture linked to many determinants of obesity development which include branded energy-dense foods and sedentary play using digital technologies. With The Food Education Project strongly believing that health begins at home and is emphasized at school, this is an important concept to establish in families with young children. This means that good habits along with bad habits may be learned and brought into and from the home along with the environment at school. Assisting young children to interact with

their interests and developing habits such as healthy eating, active play and environmental sustainable practices is always a pleasant start.

One of the changes in the fast-food industry these days is the availability of alternative choices when it comes to fast-food such as: fruits, yogurt and juices in lieu of sodas that are beginning to develop in drive-thru chains. McDonalds is not ideal for frequent meals but of course a parent will have to opt for it when it comes to convenience. It is known that fast-food come with negative health consequences such as obesity and diabetes. If children are exposed to fast-food and are comforted via drive-thru meals, the individual will certainly develop consequences down the road. The goal as parents is to prevent children from diabetes and obesity yet drive-thru is such a convenience for many families. One of the key preventions for either of these factors is to consider where the children live. Is it safe enough for children to exercise outdoors? Do the resources exist such as a community pool, local park, safe streets to bike, run or play in?

The issues of obesity and diabetes in our youth population has been addressed in the United States. It is a public health advocate to help eliminate but in the meantime decrease childhood obesity and diabetes for a healthier and better future. In terms of the ecological model, weight status has a huge role in child's behavior, dietary intake, physical activity and parents' weight status. According to Quelly (2017), roughly one third of children in the United States have been identified to be obese or overweight. Singleton (2015) concludes that staff located at specific settings may not always be equipped with the appropriate knowledge and skills to manage the complexity of the conditions that are being handled. In this case, an effective method would be to truly understand the population and/or community that you are working with.



## **II. Scope of the Project**

For the Fall 2017 semester, I am completing my fieldwork hours with The Food Education Project which is located in the Bay Area. The Food Education Project believes in health beginning at home and is emphasized at school. The Food Education Project's mission is to improve community health by teaching practices through environmental awareness. The main intent is the development curriculum that teaches children and families of four basic components: health, nutrition, food and environment through a health curriculum model. The team consists of 9 members which includes the executive director, Amanda Lesky. The program director, Jasmine Ortiz is who I work closely with during this project. The health educators include: Shauna Olsen, Jayden Ross and Tyler Brewington along with the chef educator, Shiloh Phillips and two volunteers, along with myself. The board of directors at The Food Education include: Amanda Lesky, Shiloh Phillips, Amy Safier, Dhrubajyoti Bhattacharya, Enrique Guzman, Alba Lucia Diaz and Nikki Navarette. The advisory board include Susan Penner and Rachel Russell. The program curriculum leaves its imprint in public and private schools bringing a comprehensive program to the Bay Area.

My role with the Food Education Project is an intern throughout the semester of completing my 300 hours. My intent as an intern will be to help prevent childhood diabetes and childhood obesity by implementing lesson plans for the team. My main goals are creating and maintaining lesson plans for students kinder through high school aged. Aside from lesson plans, I am also responsible for making sure to cover topics in: health, environment, food, nutrition and mental health. I am responsible for grant calendars, marketing aspect, research tables and partnership with schools in the Bay Area. Between the months of September through December, finding companies for sponsorship is also a huge part of my role. During the Thanksgiving

season, I have been asked to compile a list of chefs/restaurants in the area that we may contact to ask for food donations as well. I will also be in charge of helping with marketing projects, finding companies for sponsorship, understanding grant calendars, environmental regulation policies, epidemiology research and fundraising. One of my projects were to research a number of article that I may find grade school kids to have learned about the body systems and its effectiveness on health education. Upon using reliable sources, I went over the different systems in the human body such as: circulatory system, respiratory system, immune system and urinary system. I broke the lecture down in a manner than 1<sup>st</sup> and 3<sup>rd</sup> graders were to understand what happens in their “bodies”. While I was on the topic of bodies, I jump into body sizes and the connection of food and how it can influence body size.

My day to day activities differ through the weeks depending on what we I have been asked to focus on. It could range from compiling a list of Bay Area chefs that we may contact for the Thanksgiving holiday, creating a 3x5 card for donations (see Appendix A for more information) to hand out to potential sponsorship, creating lesson plans that target specifically middle school aged girls and much more. My role is also required to attend conference calls weekly that are with either Jasmine and/or Amanda, typically on Friday mornings. I am also in charge of researching different vitamins and what the benefits are which are presented in different classroom settings to the students.

My project has had a huge focus on lesson plans to provide for the schools that we are currently working with. One of my lesson plans was an exercise activity created to target elementary students and the objectives is for the students to be able to define exercise, students will be able to list two benefits of exercising and three fun samples of exercise. The goal is to helps students “keep moving” which is important when it comes to preventing childhood obesity

and childhood diabetes. I developed the lesson plan with the objective of students enjoying activities that promote exercise. I also took into consideration of the environment that the students are in, whether it is safe to be outdoors, always making sure that there is adult supervision at all times and adequate fluid intake. It is important to make sure that students who are not able to participate to notify the adults. I also implemented this lesson plan with little materials so that there is flexibility. Students could easily partake in exercise through jump-rope, a kick-ball, hopscotch, hide and seek and even tag.

The other lesson plan I have created for The Food Education is *MyPlate*. A group of children will gather at a centrally located school or community center and a presentation will be prearranged with a contact in the community. MyPlate lesson plan is designed with different levels of participation that is based upon varying lengths of time and circumstances. This includes lecture and activities up to 90 minutes. The objectives of this lesson is for the children to distinguish between the different food groups, educate students on how much intake you should have from each food group, describe the food groups that are incorporated from MyPlate model, an explanation of serving amounts needed daily from each of the food groups and an understanding of portion sizes that need to be consumed daily. Along with the other lesson plan, this does not require a handful of materials. The materials for this lesson plan is a large MyPlate poster, paper plates and coloring materials (colored pencils, crayons) (see Appendix B for more information on MyPlate lesson plan).

We believe the outcome of these lesson plans will help the children understand the importance of obesity and diabetes. Prevention is vital while children are young and are able to grasp the concept before it becomes too late. The information from lectures, physical activity, hands-on projects and team-building through the lesson plans is for the students to not only take

home the information but for it to be proven at school. If children are able to understand early on that childhood obesity and diabetes have long term consequences, I believe that the lesson plans and other creative ideas will eventually go a long way. I also think it is important for children to be a part of the grocery shopping, food ordering and restaurant option experience. Drive-thru is a huge convenience for our society today but if we can educate children to choose fruits over French fries, juice or water over soda and portion control – they will be able to continue making wiser choices down the road.

### **III. Public/Population Health Impact: Findings and Significance**

During my fieldwork experience with The Food Project as an intern, I achieved an innumerable amount of knowledge through the weeks. One of the most important topics that I cover in prevention of childhood obesity and diabetes is eating right, exercising and making sure that students understand the resources that are available to them in the community. I developed a handful of lesson plans that is primarily geared towards the kinder garden level through fourth grade and high-school girls. I was in charge of researching the benefits of different vitamins in minerals as well. In this part of research, I had to find the different benefits of vitamin A and D and create points for students to grasp the importance why it is needed for daily intake. The development of physical activity lesson plans was also a huge part of my duties. It was a given that the increased amount of time spent in sedentary behaviors has decreased the amount of time spent in physical activity. Research indicates that consumption of most advertised goods that included sweetened cereals, sweetened drinks and salty snacks were from advertising and marketing which is also another important topic I researched as an intern.

A study states that each additional hour of television per day increased the prevalence of obesity by 2% (Anderson and Butcher, 2006). For the exercise lesson plan, this involved lots of physical activity for a group of children. This was written for the elementary grade level but could easily be adjusted for a different audience age group. The objectives for this lesson plan involve the following: that students will define exercise, students will be able to list two benefits of exercise and they will be able to describe three fun examples of exercise. I prepared this lesson plan with little to almost none materials needed incase supplies and/or materials along with adult supervision. The students could do physical active games such as: tag, relays, hopscotch, hide and seek, “Simon Says”, jump-rope and even kick-ball. The learning activity of

this lesson plan is for children to understand why exercising is important, what types of fun it could bring and how does one exercise safely. One of the factors that is significantly linked to obesity is sedentary lifestyle. The exercise lesson plan is important when it comes to addressing the public health problem of childhood obesity and diabetes continuing to exist. Exercising may only be available for students on school grounds if their home does not provide a safe 'playground'. Some students may also be open to attending a local community park to incorporate some physical time. As for children who live in unsafe areas or who do not have access to safe, well-lit walking routes, they have fewer opportunities to be physically active. With the cases of obesity and diabetes increasing throughout the years, I found that television viewing and electronic gadgets is the cause of physical activity decreasing in recent years.

As a public health advocate, I believe the next steps to evaluating obesity and diabetes in children is through education of smarter choices, understanding the consequences of the disease and exercising safely on a daily basis. A study examining children aged 9-14 from 1996 to 1998 found that consumption of sugary beverages increased BMI by small amounts over the years (Anderson and Butcher, 2006). De Onis, Blossner and Borghi, 2010 found trends between 1990-2010 with a predicted ongoing rise from 2010-2020 in the prevalence of BMI with a +2 standard deviations are equivalent to preschool children in developed and developing countries (see Figure 1). Although it is impossible to eliminate fast food, families are encouraged to make "healthier" choices when dining out. Fast-food chains are also developing a much better concept of providing healthier choices on menus such as: 1% or 2% milk, whole fruit juices, water as drinks and entrees such as: grilled chicken versus fried chicken, apple slices and/or grilled vegetables in lieu of French fries and acceptable portion sizes. In the world we live in today, eating healthier and organic foods are at a much higher cost. My findings also conclude that a

bottle of water is pricier than a can of soda. Organic fruits and vegetables may not always be available but a bag of chips and cookies are always conveniently placed on a cashier counter.

An important factor that has been studied as a contribution towards childhood obesity is the consumption of snacks. Although it has gotten better through the years of “baked” goods such as chips, there is still a number of unhealthy snacks easily available in stores. My lesson plans that also include “MyPlate” lessons is a large contribution as an intern role to cover the public health issue. The MyPlate lesson plan that I prepared is also towards the elementary grade level where a group of children will gather at a centrally located school or community center. The presentation will be prearranged with a contact in the community and coordinated with the community members. This lesson is designed with different levels of participation based upon varying lengths of time and circumstances. I created the lesson plan to cover objectives of students to understand how much you should eat from each food group, distinguishing between the different food groups and describing the food groups that make “MyPlate”, explanation of the serving sizes that should be consumed daily. Similar to the exercise lesson plan, I have minimum resources and materials needed. MyPlate lesson plan requires a MyPlate model poster, coloring materials and paper plates to complete the activity. The lecture compiled for this activity is covering the model of the MyPlate which reflects the 5 food groups that we need to eat every day. I represented: fruits as red, vegetables as green, grains as brown, protein as purple and dairy as the color blue.

Education in nutrition, exercise and portion control is the emphasis throughout my project. One of the lectures I implemented on benefits of Vitamin A and D is for students to understand what to look for on nutrition labels and facts. My lecture covers the benefits of Vitamin A and D with the main points of: only 80% of required Vitamin D is generated by UVB

(ultra violet sunlight), UVB helps decrease in blood pressure, Vitamin D is known as the “sunshine vitamin” that plays an important role in calcium and phosphorus metabolism (Razzaque, 2016). As for Vitamin A, it is an antioxidant that maintains the immune system helping to protect eyesight, keep skin and tissues of the digestive tract and aids to keep the respiratory system healthy and supports bone growth. I also go into detail of teaching students that Vitamin A helps improve health of bones and teeth! I am hopeful that the outcome of educating students in regards of vitamins will help them realize the importance that it has from fruits and vegetables that are consumed daily.

The public health impact of my findings is the importance of educating not only students but along with parents and the community. The Food Education strongly believes that health begins at home and is emphasized at school. Therefore, education that is presented not only in classrooms but homes is a huge reinforcement. If parents are enforced a healthier lifestyle at home, a handful of obesity problems may be avoided. What children may learn in the classroom could eventually be brought home. The Food Education also developed a curriculum that teaches children and families about the four basic components: health, food, nutrition and environment through a health curriculum model. Being a part of this team has helped me find results to hopefully ending childhood diseases someday. The growing issue of childhood obesity and diabetes may also be slowed if society is able to focus on the cause. The combination of diet and exercise is one of the intervention that could easily be conducted in the community or school. The next steps as a public health advocate is to hopefully see a decrease of children being diagnosed in childhood obesity, diabetes type 1 and 2. I also believe the next steps with nutrition becoming smarter is for more afterschool programs to be developed and covered by the government so that children may have a safer place to exercise and gain information from. The



Food Education is a huge part of Bay Area and reaching out to communities is a great start of preventing childhood diseases.

#### **IV. Conclusion**

The public health impact of this project allowed me to grasp the importance of incorporating exercise and healthy eating habits at a young age in the household and in classrooms. Completing my capstone with The Food Education Project has taught me that marketing, environmental factors, prime locations of parks, convenience stores and social media all have an impact in children's well-being. The end goal in the upcoming years as a public health advocate is to combat childhood obesity and diabetes. It is important to eliminate a numerous amount of junk-food in a child's diet who should primarily be consuming healthier meals. A strong community also comes to play when children are outdoors in recreation parks or even walking home could be a part of the exercise activity for the day. Aside from healthier meals and exercise, education in the home and incorporating parents in meal-planning will be a success down the road for healthier lives and lower diseases.

References

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4099943/>

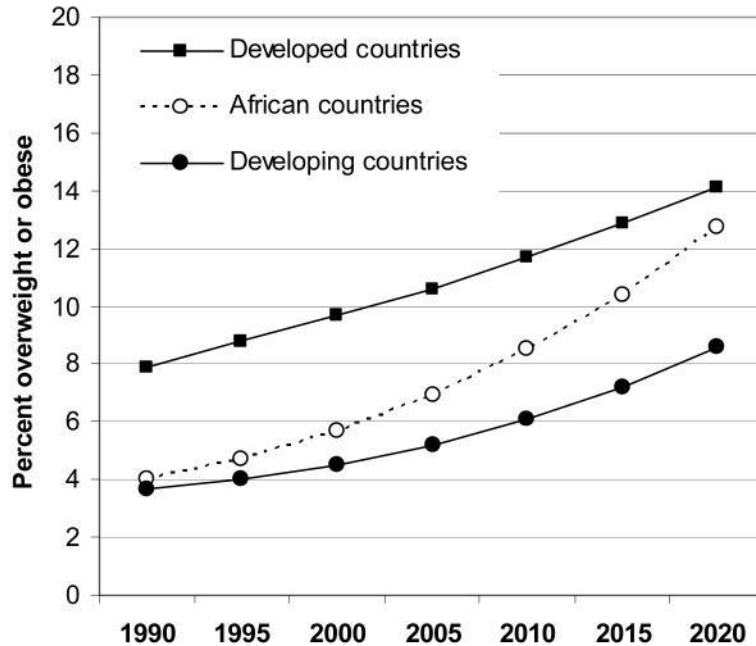
- Anderson PM, Butcher KE. Childhood obesity: Trends and potential causes. *Future Child*. 2006;16:19–45.
- Dehghan, M., Akhtar-Danesh, N., & Merchant, A. T. (2005). Childhood obesity, prevalence and prevention. *Nutrition Journal*, 4, 24. <http://doi.org/10.1186/1475-2891-4-24>
- de Onis M, Blossner M, Borghi E. Global prevalence and trends of overweight and obesity among preschool children. *Am J Clin Nutr*. 2010;92:1257–64
- Lakshman, R., Elks, C. E., & Ong, K. K. (2012). CHILDHOOD OBESITY. *Circulation*, 126(14), 1770–1779.  
<http://doi.org/10.1161/CIRCULATIONAHA.111.047738>
- Nerud, K., & Samra, H. (2017). Make a Move Intervention to Reduce Childhood Obesity. *Journal Of School Nursing*, 33(3), 205-213.
- Pulgaron, E. R., & Delamater, A. M. (2014). Obesity and Type 2 Diabetes in Children: Epidemiology and Treatment. *Current Diabetes Reports*, 14(8), 508.  
<http://doi.org/10.1007/s11892-014-0508-y>
- Quelly, S. B. (2017). Characteristics Associated with School Nurse Childhood Obesity Prevention Practices. *Pediatric Nursing*, 43(4), 193-199.
- Razzaque, M. S. (2016). Review: Sunlight exposure: Do health benefits outweigh harm?. *Journal Of Steroid Biochemistry And Molecular Biology*,  
doi:10.1016/j.jsbmb.2016.09.004

Singleton, S. (2015). Looking after schoolchildren with diabetes: Development of the Individual Healthcare Plan. *Journal Of Diabetes Nursing, 19*(6), 223-227.

Skouteris, H. ), Morris, H. ), Cox, R. ), Edwards, S. ), Baur, L. ), Wolfenden, L. ), & Huang, T. ). (2017). Early childhood education and health working in partnership: the critical role early childhood educators can play in childhood obesity prevention. *Early Child Development And Care, 187*(8), 1239-1243.

doi:10.1080/03004430.2016.1278370

Figure 1 – Trends Among Developed Countries



Appendix A – Marketing Project for Donation Request



At **The Food Education Project**, we believe health begins at home and is emphasized at school. We teach from 2:15-3:15PM on Mondays in the cafeteria at Immaculate Conception Academy, located at **3625 24<sup>th</sup> Street San Francisco, CA**. Food Education Project has been a part of ICA for 5 years! We have developed a curriculum that teaches children and families about *four* basic components: health, nutrition, food, and environment through a health model.

Donation request options of:  
 \_\_\_\$10 \_\_\_\$20 \_\_\_\$35 \_\_\_ \$50  
 (with the goal in mind for \$800 for the year)

Cash, check, or money order to the Food Education Project PO Box 640082 San Francisco, CA 94164 or send in with your student to class.

\*Sponsor option of a “food demo” where all students actively participate in an elaborate food presentation to class.



<http://www.foodedproject.com>

Appendix B – My Plate Lesson Plan

**Lesson Plan**

Prepared by: Karen Carig

**Title:**

*My Plate (portion size)*

**Grade Level:**

- Elementary

**Description of Participants:**

- A group of children will gather at a centrally located school or community center. The presentation will be prearranged with a contact in the community and coordinated with the community members. The lesson is designed with different levels of participation based upon varying lengths of time and circumstances. It includes lecture and activities for up to 90 minutes.

**Objectives of Lesson:**

1. Distinguish between the different food groups
2. Know how much you should eat of each food group
3. Describe the food groups that make up my plate.
4. Explain the serving amounts needed daily from each of the food groups.
5. Explain portion size that needs to be consumed daily.
6. Reinforce food pyramid lesson

**Resources and Materials Needed:**

**Materials:**

- Large MyPlate poster
- Paper plates
- Coloring materials
- Optional:
  - o MyPlate printout (4 max copies)
  - o Cards from resource 1

Resources:

- <http://www.learningzonexpress.com/documents/EnergyEverydayforEveryone/MyPlateLessonPlans.pdf>
- <http://www.allianceforaging.org/NutritionEd/July2009.pdf>

**Lecture:**

- My plate was created to make it easier for us to visualize how much of each food group we should eat. It's another, simpler version of the food pyramid.
- Here we have a model of the MyPlate which shows us the 5 food groups that we need to eat every day.
  - o Fruit = red, vegetables = green, grains = brown, protein = purple and dairy = blue.

Fruits and Vegetables:

- Start with a class discussion: have each student list his or her favorite fruit and vegetable. Ask the students how much of their plates are normally taken up by fruits and veggies. Ask them how they feel about trying new fruits and vegetables. What could make it easier?
  - Choose fresh, frozen, canned, or dried fruits and vegetables. (Which forms are the best?)
  - Eat red, orange, and dark green vegetables, such as tomatoes, sweet potatoes, and broccoli, in main and side dishes. (What are some examples of dishes you like that include these foods?)
  - Use fruit as snacks, salads, or desserts. (Why is fruit a good dessert choice?)
  - Keep raw, cut-up vegetables handy for quick snacks. (List some veggies you could use for this.)
  - Choose whole or cut-up fruits more often than fruit juice. (Why is this a good idea?)

Grains:

- Begin by asking the students to name some grains. (Wheat, corn, barley, oats, rice, etc.)
- At least half of the grains should be whole
  - o A whole grain is made up of three parts: The bran, the endosperm, and germ
  - o Explain that every grain that grows is a whole grain in its original form.

## Running Head: PREVENTION OF CHILDHOOD OBESITY AND DIABETES

- The difference between whole grains and refined grains is that whole grains include all three parts of the grain and refined grains have been stripped, leaving only the endosperm portion of the grain.

### Protein:

- Begin by telling students that protein is necessary for building strong muscles and body tissues and that it helps sustain energy so that we do not tire as quickly.
- There are many sources of protein—meat and nonmeat. It is important to eat from a variety of protein sources. Protein portions should be small and lean (not fatty).

### Dairy:

- Explain to students that dairy products contain calcium—a nutrient that helps build strong bones.
- Ask them to give examples of dairy products.

### Serving size –

- Fruit: you need 1 and half cups
  - (1 medium apple is one cup, a large banana is 1 cup, half a peach is half a cup, and a half cup dried fruit counts as 1 cup of fruit as well).
  - Eat a variety of fruits (eat a rainbow!)
- Vegetables: 2 1/2 cups in a day.
  - Eat more dark green veggies like broccoli, spinach, and other leafy green vegetables
  - Eat more orange vegetables like carrots and sweet potatoes
- Grains: 6 ounces, 3 of which should be whole grain.
  - 1 slice of bread, 1/2 cook rice or pasta, 1/2 cup ready to eat cereal is considered to be 1 ounce).
- Proteins: 5 1/2 ounces
  - (1 can of tuna drained is equivalent to 3-4 ounces, 3 eggs whites make 2 ounces, and 1 small lean protein is 2 to 3 ounces)
  - Pick low-fat or lean proteins
  - Bake it, broil it, or grill it
  - Vary your protein – try more fish, beans, peas, beans, nuts, and seeds
- Dairy: 2 to 3 cups



- 1/2 cup cottage cheese is equivalent to 1/4 cup milk or 1 snack size container of yogurt has 1/2 cup milk.

**Display:** Large MyPlate poster

**Activity:**

- Hand each child a plate and have them color it according to the poster
- Have the draw different foods that belong in each category

**Additional Activity:**

- Print out the number of food and activity card sets you need (1 per team) (resource 1)
- Divide the students into even teams (at least 2) and have them line up behind a starting line. Place one basket at the starting line for each team. The cards should be placed in the starting line basket. The MyPlate printout should be placed at the finish line for each team.
- Students line up single file behind the basket. The first child draws a card and does the activity listed on it (running, walking, skipping, crab walking, etc.) to get to the finish line.
- He or she then places the card on the corresponding part of the plate (i.e. grilled chicken on purple protein section). The child runs back to the starting line and tags the next player. The team that finishes first and has their cards on the right parts of the plate wins.

**Opening Strategy:**

Discuss with the children:

Do they know which food groups they should eat more of? Less of? Why?

**Learning Activities:**

1. Display the MyPlate model, and explain to the students that this displays the food groups that need to be consumed daily.
2. Reinforce the five groups associated with My Plate.
3. Display each of the food models and explain what benefits they have for the body.
4. Explain how many servings are recommended daily from each of the groups.
5. Demonstrate what a food serving is.

**Assessment/Evaluation (10-20 minutes):**

- Can the children name the different sections on MyPlate?
- Do the children know how big each section of MyPlate is?
- Do the children know how much they should eat of each food group?

Appendix C – Competency Domains

Evidence Based Approaches to Public Health  
 Leadership  
 Policy in Public Health

1. Select quantitative and qualitative data collection methods appropriate for a given public health context.
2. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
3. Assess population needs, assets and capacities that affect communities’ health
4. Select communication strategies for different audiences and sectors
5. Apply systems thinking tools to a public health issue

Competency:	Method of Achievement:
2. Select quantitative and qualitative data collection methods appropriate for a given public health context	I contributed lesson plans that contained both quantitative and qualitative questions in order to collect information to get a better understanding of children’s’ knowledge on health topics.
5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings	While working with the Food Education Project, I looked into the WHO, National Institutes of Health and CDC to understand structure and functions.
7. Assess population needs, assets and capacities that affect communities’ health	I researched into the Bay Area populations and what the communities were struggling with.
18. Select communication strategies for different audiences and sectors	I was able to create announcement cards for children to bring to their parents along with referencing our website which is electronic.
22. Apply systems thinking tools to a public health issue	Creating a design tool that is geared towards obesity and diabetes. Such as, an app that will help locate healthier food options within a persons’ current location.