

A Weighty Battle: Helping Children Fight Obesity

Joyce Arnosky

Penn Alexander Elementary School

Overview

Background and Rationale

Objectives

Strategies

Classroom Activities

Annotated Bibliographies

Overview

This two-week, cross-curricular unit for fifth grade encompasses several disciplines: mathematics, literacy, and the visual arts. It is not intended to replace the School District of Philadelphia core curriculum, but to build upon and supplement strands already introduced. It is designed to make students aware that obesity is a serious problem not just for adults, but among children as well. It aims to educate them as to its causes and consequences and also teach them what can be done about it. The ultimate goal of the unit is to provide students with sufficient knowledge to self-regulate and make intelligent and informed decisions about their food choices and physical activities when they are out of their parents' "sphere of influence".

Background and Rationale

Childhood obesity in this country has reached epidemic proportions. Thirty years ago five percent of children age 19 and under were overweight or obese. Today more than 30 percent of children can be classified as overweight, of these children 50 percent are obese. The number of children between the ages of six and eleven who are overweight in the United States has more than tripled since 1970. It is a problem in all states and cuts across all socio-economic groups, though it disproportionately affects African Americans and Native Americans. What does this say about the future? Some public health officials estimate that by 2010 almost 50 percent of children will weigh too much. Statistics suggest that 80 percent of the children who are overweight at this age will become obese adults. "Many experts fear an exponential increase in heart disease, strokes, cancer and other health problems as the children move into their twenties and beyond. The evidence suggests that these conditions could occur decades sooner and could greatly diminish the quality of their lives. Many could find themselves disabled in what otherwise would be their most productive years." (Levine, Stein 12) The Center for Disease Control and Prevention (CDC) has stated that this may be the first generation of children who fail to outlive their parents.

Doctors have been observing the trend towards childhood obesity first hand for many years, but it is only in the last decade or so that childhood obesity has become a serious public health issue. Treatment of childhood obesity is expected to add billions of dollars to the U.S. health-care system. Health-care costs associated with obesity related issues in adults already cost the nation \$117 billion annually and were recently estimated to exceed the health care costs of smoking and problem drinking. Treating an obese child is three times more costly than treating a child of healthy weight and this increased cost could potentially add upwards of \$14 billion dollars annually to the health-care bill. (Dietz). Speaking at a conference in 2001, Dr. Dietz observed that, "Obesity related health costs to the general public are expected to run to the hundreds of billions by 2020, making HIV look, economically, like a bad case of the flu". (Dalton)

What is obesity exactly? How is it defined and diagnosed? Diagnosing clinical obesity is complex. Not all children carrying extra weight are overweight or obese. The scale can show a child's weight, but that's really not the whole story. Children carry varying amounts of body fat throughout their developmental stages and growth patterns differ child to child. Muscle mass is denser and weighs more than fatty tissue, so children who are athletic or have large frames may register as overweight on the charts. To make an accurate assessment, a pediatrician would need to do a complete work-up of the child. In addition to weight, the doctor would need to consider many additional factors: age, height, rate of growth, frame, fat to muscle ratio, family history of obesity and diabetes, eating habits, activity levels and other health conditions.

There are many tests doctors can use to determine whether a child is overweight such as skin-fold measurements, bioelectrical impedance, dual energy X-ray absorptiometry (DXA) scans and underwater weighing. These are all very sophisticated and precise, but expensive and time-consuming. The most widely used measurement for determining overweight or obesity, however, is BMI-body mass index. It is a number calculated from a child's weight and height. According to the CDC, it doesn't measure fat directly, but research shows it correlates to direct measures of body fat. It's a screening process, an early warning system to alert parents and physicians to a child's risk of becoming overweight or obese. BMI is calculated using a formula (weight in pounds divided by height in inches squared, multiplied by a conversion factor of 703). After the BMI is calculated, it is plotted on the CDC BMI-for-age-growth charts (for either boys or girls) to obtain a percentile ranking. Children whose BMI index is between the 85th and 95th percentiles for age and gender are considered to be at risk for becoming overweight. Children with a BMI equal to or beyond the 95th percentile are considered obese.

So how did we get so fat? On the surface it may seem incredibly simple – too much energy (calories) taken in, too little energy burned. Researchers, however, while acknowledging that a problem certainly exists, caution that the causes of obesity are far less clear. It is a mix of many factors. It is complex because it has biological, behavioral,

social, economic, environmental, and cultural causes, which together, over time, have made it difficult for us to maintain a healthy weight.

“It’s in the genes” is often cited as a cause of obesity. But genes alone cannot account for the soaring rate of obesity in the past several decades - human genetics cannot possibly have changed so dramatically in just a few decades. Inheritance does play a part. Genes help determine your body type and how it stores and burns fat just like they determine other family traits. They can predispose approximately 20 percent to 60 percent of the population towards obesity, but that leaves a large percentage to be accounted for by environmental factors. Often though, nature and nurture act as “co-conspirators” and being overweight runs in families because of shared genes as well as shared environmental and social factors. People in the same family usually have the same eating and exercising habits and share similar attitudes about being overweight. (Rimm)

Psychological factors greatly affect our eating patterns and habits. Food is basic – it’s necessity, love, and happiness. It’s difficult to think of any time in our lives when food wasn’t an accompaniment, provided for celebration or offered as solace. Food is comfort. We often find ourselves overeating because of stress or out of boredom or to cope with problems or to deal with emotions.

City and suburban designs do little to encourage walking and other physical activities. Fewer children walk to school now and communities do not have central shopping areas that people can walk to.(Dietz) Playing outside for many children is simply not an option because very often it is not safe. Budget constraints, emphasis on high stakes testing and pressure to fit everything into the day have forced schools to cut back on, or eliminate, health and physical education courses.

Children now spend hours each day in front of some sort of electronic screen. The results of a study by Wiecha, et al reported that each hour of television viewing was associated with an intake of an additional 167 calories per child. Furthermore, that these calories tend to be consumed from foods usually advertised on TV – calorie dense and low nutrient foods such as salty snacks, sodas, fried potatoes, sweet baked snacks, candy, and main courses from fast food restaurants.

Families are pressed for time and money, making cooking from scratch with fresh ingredients costly and time-consuming. Fast food, high in fat and calories, has become the default meals for busy families

Socio-economic factors are also a consideration. Poverty and obesity often go hand in hand. In some poor communities, there are no large supermarkets so there is little access to fresh, healthy foods. If there are fresh fruit or vegetables available at local corner stores, they are usually prohibitively expensive.(Foster, et al)

Childhood obesity has serious physical consequences. Researchers have found that being fat as a child seems to be even more destructive than becoming fat as an adult. Dr. Dietz notes that obese adults who were obese as children have much more severe obesity than adults who became obese in adulthood. Overweight children are at risk for diseases that once only afflicted adults. Almost all the major organs are involved and the damage done may be irreversible. "Obesity kills slowly, causing damage from head to toe with painful, lasting effects." (Levine, Stein) Obese children are prone to pseudotumor cerebri, a buildup of fluid around the brain. It causes severe headaches and blurry vision. Extra weight is associated with insulin resistance and Type 2 diabetes. Overweight children are more likely to have hypertension or high blood pressure – two silent precursors to cardiovascular disease that make them at risk of developing heart disease as early as their early twenties. Other diseases associated with excess weight are metabolic syndrome, fatty liver disease, inflammation of the gallbladder, asthma and other respiratory disorders, sleep apnea, early onset of puberty and skin infections. Being overweight puts stress on the musculoskeletal system resulting in knee problems and other orthopedic conditions.

In addition to the physical consequences, overweight children face a large number of social and emotional issues. The emotional toll of obesity is intense and, on some levels, even more debilitating than the physical manifestations. It affects every aspect of their lives and prevents them from doing anything to help themselves." Overweight children are often outcasts in middle and high school. They may be shunned by their peers and rejected for friendships and scholarships. They are stereotyped as dumb and lazy...The world does not seem to understand or care about them, empathize with them or even wish to reach out to help them." (Rimm)

Children who are overweight experience low self-esteem as a result of being bullied, teased, or rejected by their classmates or peers. In an article on obesity written by the Mayo Clinic staff, they report that overweight children have greater anxiety and poorer social skills, which may lead to acting out and disruption in the classroom. Stress and anxiety interfere with learning. School related anxiety can create a vicious cycle – the more a child worries, the more academic performance declines.

Overweight children experience depression and increased thoughts of suicide. In a recent study, obese children and adolescents reported "significantly lower health-related quality of life in comparison with healthy children and adolescents." These children reported their quality of life as similar to children and adolescents who had cancer and who were receiving chemotherapy. (Schwimmer, et al)

Now that we as a country have finally acknowledged the health, psychological, and social costs of childhood obesity, it is time to consider what can be done. If we agree that obesity is a disease, we imply that it can be treated medically with drugs and surgery.

These are not, however, appropriate methods of treatment for the majority of overweight children. Dieting, most researchers agree, does not help either. Growing children need a wide variety of proteins, carbohydrates and fats in order to assure healthy development. That is why prohibiting any one group of foods is not a good idea. Maintaining balance in food choices and eliminating refined, highly processed junk foods is a better strategy that teaches children healthy choices for the long run.(Ludwig)

Most experts agree that prevention is the best treatment for obesity. However, the causes of obesity are complex and intertwined and researchers are as yet uncertain of exactly how all the pieces fit together. Consequently they are struggling to find an effective strategy to prevent and control obesity. There are few scientific studies that have tested potential solutions in the diverse contexts in which obesity is seen and no proven effective population based solutions. (Koplan, et al) Does that mean that no action can be taken or recommended while researchers are in the process of gathering conclusive evidence to support a definitive mode of treatment? Michael Erickson suggests, “In the absence of any precise understanding of the etiology of the problem, it may be useful to look at the lessons learned from other public health campaigns to see if these have any relevance for the prevention of childhood obesity....The process worked for seatbelts, smoking, and car- seats.” In a study which looked at lessons from the tobacco experience and their applications to the control of obesity, researchers noted that “individual based single modality interventions won’t significantly impact the problem” What does seem to work are approaches that include education and comprehensive population based programs as key components. (Mercer, et al)

“Culture is not a static set of beliefs and practices. These changes in society’s outlook and behaviors have occurred once there was a collective understanding of the severity of the problem and its impact on health, and the mobilization around the potential for improvement.”(Koplan, et al 335) When institutions, organizations and individuals begin to make changes and shift their thinking, the social norms will change. Obesity in children and adolescents will be considered as a health problem that can and should be prevented, just as we have worked to prevent other childhood diseases such as polio, chickenpox, mumps and measles.

Childhood obesity is a major public health issue and, as with other public health initiatives, change must come about through long-term commitment that is multi-faceted and involves a wide array of collaborative partnership among such diverse groups as corporate board rooms, federal agencies, elected officials, health insurers, health and medical professionals, public health resources, communities, schools, teachers, parents, friends, relatives and the children themselves. The school environment would seem to be the best place from which to launch a national childhood obesity prevention effort. Children spend more than half of their waking hours in school. Schools provide one to two meals daily and are a natural setting for education about healthy eating and lifestyle choices

A longitudinal study was initiated in 1997 to assess the effects of a school-based, interdisciplinary, health behavior intervention (Planet Health) on the diet and physical activity levels among urban primary school children in grades 4 and 5. The key to the program was that it was interdisciplinary and taught through the established curriculum by classroom teachers. Additionally, it provided links to the school's food service and physical education components and reached out to the homes and community of the students. The goals of the program were to decrease fat consumption and TV viewing and increase consumption of fruits and vegetables and physical activity, ultimately enabling the students to make sustainable changes in their own behavior. Researchers, (Gortmaker, et al) reported that, though not all goals had been met to the degree hoped for, modest improvements in all categories were noted. This would seem to indicate that a school-based intervention has promise as an effective approach to reducing obesity in children.

Most recently, results of a two year study conducted in ten Philadelphia, Pennsylvania schools showed that a multi-component, integrated, interdisciplinary school-based intervention can be effective in curbing the development of overweight among inner-city children (the most at-risk population) in grades four through six. (Foster, et al) In the schools where the program was not implemented, 15 percent of children who were not overweight at the beginning of the study were overweight at the conclusion. Of the group who were not yet obese at the onset of the study, 6 percent were considered obese at the end of two years. The intervention had no effect at the upper end of the BMI. "Progression to or remission from the 95th percentile and upward may be more likely to result from targeted or clinic based programs than from untargeted approaches such as the School Nutrition Policy Initiative."(Foster, et al)

It would appear that education is one of the best ways we can arm children in the fight against obesity. Studies indicate that a multi-faceted, interdisciplinary program should be instituted by the fourth or fifth grade. This is a time when thinness attitudes are still evolving and when children's social attitudes and beliefs can be changed or reconfigured. This unit is designed to provide children with such a multidisciplinary approach. It will provide them with information about the causes and risks of childhood obesity and the skills needed to make healthy food and activity choices now and as they progress towards adulthood.

Objectives

Building on their background knowledge and experiences, students will explore the topic of childhood obesity. They will understand what it is, its causes and its deleterious effects. Incorporating a variety of learning modalities throughout the content areas of literacy, math and visual arts, students will learn to make healthy choices in their diet and physical activities. They will understand how healthy behaviors are interrelated and that

acquiring good eating and exercising habits now will not only assure a healthy childhood, but will carry over into adulthood.

Strategies

This unit encompasses several curricular areas: mathematics, literacy and visual arts. Consequently, a variety of strategies will be used throughout.

To begin the unit, students will work in groups to identify prior knowledge and beliefs about what obesity is and the problems associated with it. Groups will synthesize their results and report to the class. The class results will be combined and revisited at the end of the unit when students will discuss the initial results and what they have learned since.

The unit will be introduced through a read-aloud of *The Gulps*, by Rosemary Wells. This is a picture book about a family that loves junk food and their sedentary life style. Through a series of adventures, they change their habits with interesting results.

Once the unit has been introduced, students will begin discussing and creating their data collection questionnaires. They will conduct their research, then collect and represent the data using graphing software or hand-crafted graphs. They will analyze the results and determine what their peers know about the topics overweight, healthy food choices, activity, etc. They will represent the findings in written report.

Students will calculate BMI and calories consumed in their daily food journals. Also their favorite fast food selections, calorie expenditures, and the number advertising minutes devoted to junk food they have watched.

Throughout the unit, students will be reading and writing in a variety of genres. They will research diseases associated with obesity and write a report explaining the nature of the disease and its connection to obesity. They will read and discuss young adult fiction relating to children who are suffering the social and emotional effects of obesity. They will also read and discuss non-fiction accounts written by overweight students. They will read food and exercise journals of (fictitious) students and make recommendations on ways to improve food choices and activity levels. Students will also be able to read and decipher nutrition labels.

For their public service spot, students will determine a format (play, interview, etc.) and write the script making sure that all information they learned is presented. They will learn the most effective ways to record, rehearse and edit the spot.

The finished product will then be presented to their peers.

Classroom Activities

Lesson 1 – What do we think we know and what do we believe about obesity?
Introduction to the unit

Students will begin the unit by creating, in small groups, a silent mind map on the topic of obesity. This will help determine their prior knowledge and beliefs about the subject.

Students will be introduced to the topic through a read-aloud of *The Gulps*, by Rosemary Wells. After the read-aloud, the class will share out the results of their maps. The discussion should touch on questions such as:

What do students think is fat/overweight? Do the two words mean the same?

What is the connotation of each?

What makes people fat?

How can the situation be changed? Is it easy?

How would students describe the way overweight children are treated?

Do students think overweight children are sad?

Do students think overweight is a problem among children?

What questions do they have on the topic?

As the discussion proceeds, have a student record the responses to these questions on chart paper. Review the questions and answers. Keep the recorded responses to review with students at the end of the unit to discuss what they have learned and any changes in attitude that occurred as a result of their work during the unit.

The students will be introduced to the unit – its objectives and the work they will be doing throughout.

Lesson 2-What science says about the causes and consequences of childhood obesity

Through a teacher prepared power-point presentation, students will take notes for an overview of the subject of the unit. They will use these notes as background information as they continue work on the unit

Lesson 3 – What do other fifth graders know about the topic of childhood obesity?
Creating questions to determine what students know, then collecting, representing, and interpreting the data

Lesson 1 - Prologue

If students have not had a great deal of experience with the real work of data collection and analysis, begin with lessons that take students through the recognizable phases of the

process as well as emphasize the significance of each. These lessons should also highlight and elaborate some key concepts surrounding data collection and analysis such as:

- What questions to ask?
- What is sampling?
- What does “typical” mean?
- How do you represent what you collected—what format would best show the ideas?
- What is the meaning/significance of the information?
- To whom will you communicate this information?

An excellent initial lesson to try is *The Left Handed Experiment* created by Marilyn Burns (68). By taking a sample of students in their school, students will determine approximately how many right-handed people there are for every left-handed person. The author also provides extensions that can be used to piggyback on the processes and concepts.

The most important factor of data analysis is the discussion and reflection. At the conclusion of this introductory lesson—it is important to take the time to debrief.

Ask students to consider:

- Was their question clear?
- Did they think of another question that might have been better?
- Was the sample truly representative?
- What led them to organize the data as they did?
- What did the data tell you?
- How can this data be of use?

The lesson concludes by asking students to prepare a report describing the data. At this point it would be very useful to have a sample of student work or a teacher prepared response to show students. Using a transparency and the overhead, discuss with students the type of information to be included, the aspects they could consider discussing, and the proper way to communicate their findings using the language of mathematics.

Lesson II- Part A - Launch

Provide students with a copy of a data set that is relevant to them (i.e. Bed Times, TV Watching, etc.).

Give an introduction/overview of the data and ask the students to look more closely at it. Ask them what they notice about the data and to describe it in as much detail as possible.

Since it will be data that has meaning to them and their age group, ask them if they think this represents the results their class would give.

Pick a topic from the data and ask students to frame a question around it and to determine how to collect the data. If necessary, clarify any particulars about the situation depicted in the question.

Collect data from the class. Record it quickly in a line plot.

Ask students what their data set shows about them as a class.

Have students compare their data with the original data and analyze the similarities and differences.

Part B: Explaining the Project

As a class, brainstorm the questions that students would want to ask to determine what their peers know about obesity and healthy eating and list questions on the board or chart paper. These will become the basis of a survey students will conduct.

Have students discuss the questions. Would they give an observer an idea of what students know, or think they know? Are there other questions that come to mind? Can certain questions be re-phrased/re-worded to be more revealing?

Once students have evaluated questions, have them decide on a format for the questions and the answers. Will they create a multiple choice answer set, or will they want an open-ended response?

Remind students to consider the question of sampling. Will they ask everyone in the class? Will they get a big enough sample to draw any conclusions? Should the other fifth grade classes be surveyed? Should the questionnaires be given to 4th grade classes?

Once students have decided on the questions and the answer format, prepare the surveys, copy and distribute them. Students will begin the process of collecting the data.

Lesson III – Analysis and Reporting: Taking a look at the data and deciding what it all means

Once students have completed the collection of the data, group students into teams or partnerships.

Assign each team a question and give them all the class responses to that question.

(This can be done by cutting apart the surveys and giving each team the responses to that question).

Students will then chose a graph format and use it to represent their findings.

Note: There are several computer programs that will create the physical graph once the data has been entered. Teachers may chose to use this feature and shorten the time spent on crafting the graph so that more time can be devoted to the actual analysis of the data.

Students will, in their small groups or teams, discuss the data. What does it say about the fifth grader's knowledge about the topic? What conclusions can they draw from the data? What could be the reasons for the outcomes?

Assessment Part 1: Students will create a report of their findings and present it to the class.

Assessment Part 2: Make all the data and the student reports available to the class. Have students categorize and synthesize the data and create a final report.

Possible extension: students could survey screen time in front of TV, computers and gaming. They could then create graphs to represent the data they collect and reports to explain what the data indicate.

Lesson 4 – What do we eat? How much? How many calories?

Students will take a look at their own eating habits by keeping a food journal for two days. The students will be taught how to record the food, the quantity, and the caloric value (from an on-line site) of everything they eat during this period. Through a classroom demonstration, students will learn what constitutes a “portion “ of a variety of foods such as fruits, vegetables, bread, milk, cheese, pasta, beans, peanut butter, cereal, snack foods, sodas. Class can then share the samples.

Lesson 5 – Get your motor runnin’

Students will keep an activity journal of everything they do for the two days they are recording their food intake. They will go on line to a site that will help them calculate how many calories are burned for each of their activities and how many calories have to be burned to lose a pound. They will total up the calories burned for each day.

Lesson 6 – The consequences of obesity

As a class, students will use their background notes to review and discuss the serious consequences of obesity. They will be randomly assigned a disease that is associated

with obesity. Students will begin their research by generating a list of questions they have about their topic. Using a variety of resources, they will read, take notes and write a report on their topic. Research reports will be approximately 1-2 pages long and will include an appropriately prepared bibliography. Students will submit a first draft that will be corrected and returned to them for revisions before submitting a final copy.

Research reports will be completed individually. Students who have the same topic will then be grouped together to share their research and prepare a group report to be presented to the class. Students will be expected to take notes during presentations.

Students will be responsible for researching and writing independently throughout the unit.

Lesson 7 – What is the Food Pyramid and why do we need to know about it?

Students will learn about the food pyramid through My Pyramid Game, an interactive game at www.dairyCouncilofCA.com.

Using their knowledge of daily requirements based on the pyramid, students will work in groups to analyze their food and activity journals. They will consider how their food choices, and those in their group, compare to what they should be eating. They will look at the calories they took in and compare these with how many they expended. Are they even? What does it mean if they are not even? They will write recommendations for possible improvements in their food choices and activity levels.

As a class, students will brainstorm a list of favorite fast food items. In groups, students will plan a meal and calculate the calories, and fat content of their choices. Once they have done this they will analyze their choices. Did they use any information learned from the pyramid to guide their choices? Would they do so the next time? Why, or why not?

Students will repeat the activity of tracking food and activity levels for an additional two-day period towards the end of the unit to determine if they have made any positive changes.

Lesson 8 – How is obesity determined?

Students will use their background notes to review how obesity is determined and what exactly BMI is. Students will be provided with the height, weight, age, and gender of several fictitious students. They will learn how to calculate BMI of these “students” using the formula. They will also calculate BMI using published charts.

Lesson 9 - How do we decide what foods to eat?

Introduce the next section by discussing with the class who in their house decides what to buy when food shopping for the week. How are the decisions made? Can children make suggestions? Will they get what they ask for? What does it depend upon?

Discuss the aim of advertising with students. Ask if they feel they are influenced by what they see on TV commercials to ask a parent to buy a particular item.

Have students watch one hour of Saturday morning children's TV. Have them keep track of all commercials, noting the product or content and the length of the commercial.

Students will then analyze what they observed. Can they categorize the products/content? What percent of the total time was devoted to commercials? Students will create circle graphs to represent these data. Students will then write about their response to these commercials. What were the commercials like? Were they flashy, colorful, loud, and very persuasive? Were they influenced by any of them? Did they think they might want any of the products advertised? What products and why? Did they understand the point of view of the advertisers? What might the effect of these commercials be on younger children?

Lesson 10 – Putting it all together

Students will begin by taking another look at their food and activity journals to analyze their habits and note any improvements. They will also discuss their findings on Saturday morning TV advertising.

Today, students will begin planning their “Public Service Spot” aimed at informing their peers about childhood obesity. They will decide what information will go into the presentation and how it will be presented. They will decide on a director, writers, actors and videographers. Once the assignments have been decided upon, students will begin work on the project. Students will be allotted several days to complete the work during their literacy block.

The finished project will be presented to the other fifth grade classes. Time will be provided for a student led question and answer period following the presentation.

Materials

Lesson 1

Sheets of chart paper and markers, one set per group.

Lesson 2

Power-point background lesson
Mayo Clinic article provides good information, logically sequenced
Note-taking packet for students

Lesson 3

Transparency modeling what a report on data would include
Set of data on a topic of interest to students

Part B

Copies of student prepared surveys - enough for each student, or each pair of students

Lesson 4

Prepare a food journal page students can use to record their food intake and physical activities for two days. Include sections for food type, quantity of food, number of calories consumed, type of activity, time spent doing each activity and the number of calories burned in the day. NOTE: Be sure students save these journals for use in Lesson 7

A variety of foods, measuring cups, measuring spoons, and bowls to demonstrate appropriate portion sizes

Lesson 7

Planet Health.org sample lessons can be used at this point

Lesson 8

Prepare a set of “student cases” listing height, weight, age and gender for students to use as they calculate BMI

Copies of CDC BMI-for-age charts and calculators

Lesson 9

Prepare and copy an organizer for students to use to record their TV ad observations

Lesson 10

Video camera, projector
Assorted drawing materials

Bibliography

Note: * Designates material helpful to teachers as sources of background information

Berg, FM. *Underage and Overweight*. New York: Hatherleigh Press: 2004.

In this book, the causes and consequences of childhood obesity are clearly set out. The author offers concrete suggestions on how a united front of parents, educators, and health care workers can solve the obesity crisis.

*Dalton, S. *Our Overweight Children: What Parents, Schools, and Communities Can do to Control the Fatness Epidemic*. Berkeley:University of California Press: 2004.

The author begins by detailing the nature of the obesity epidemic and explains how it affects children, their parents and society in general. She offers recommendations for combating the epidemic that are comprehensive and include all the stakeholders.

Ericksen, Michael. *Lessons Learned From Public Health Efforts and Their Relevance to Preventing Childhood Obesity*. Appendix D. *Preventing Childhood Obesity: Health in the Balance*. Washington, D.C. National Academies Press: 2005.

<http://books.nap.edu/openbook.php?-recordid+11015>. Accessed April 16, 2008.

This article explores the way public health issues have been successfully handled in the past and makes recommendations for handling the obesity epidemic based on earlier successes.

Ford-Martin, P. *The Everything Parent's Guide to The Overweight Child*. Avon: Adams Media: 2005. A very useful, easily accessible book providing a solid overview of childhood obesity and its causes. She provides insights into how to help children and parents break the cycle of obesity by learning to eat well and become more physically active.

*Foster GD, Sherman S, Borradaile, KE, et al. A Policy Based School Intervention to Prevent Overweight and Obesity. *Pediatrics*. 2008;121:794-802. Available at:

<http://pediatrics.aappublication.org>. Accessed May 7, 2008

This study examined the effects of a multi-component school based intervention in preventing the development of overweight and obesity in students in grades 4-6, in urban public schools, with a high percentage of economically disadvantaged students..

Gortmaker,SL, Cheung, LWY, Peterson, KE, et al. Impact of a School Based Interdisciplinary Intervention on Diet and Physical Activity Among Urban Primary School Children: Eat Well and Keep Moving. *Archives of Pediatric Adolescent Medicine*.1999: 153:975-83. Available at:

<http://www.ncbi.nlm.nih.gov/pubmed/10482216>. Accessed April 7, 2008.

This is a report on a study designed to evaluate the effectiveness of a school-based interdisciplinary health and behavior intervention (Eat Well and Keep Moving, designed by researchers Harvard) on diet and physical activity among children in grades 4 and 5.

Koplan,JP, Liverman, CT, Kraak, VA, eds. *Preventing Childhood Obesity: Health in the Balance*. Washington, D.C. National Academies Press; 2005.

<http://books.nap.edu/openbook.php?-recordid+11015>. Accessed April 16, 2008.

This is a report by a committee of 19 experts in child health, nutrition, fitness and public health in response to a request from Congress for an obesity prevention plan, based on sound science, using the most promising approaches.

Lauren, M, Baron, A. *Childhood Obesity: The Effects on Physical and Mental Health*; education.com; <<http://aboutourkids.org>> February 6, 2008; Accessed, February 18, 2008. An overview of the physical and emotional effects of childhood obesity.

Levine, S, Stein, R. Obesity Threatens a Generation: “Catastrophe” of Earlier Deaths, Higher Health Costs. *Washington Post*. A1, A12, A13, A14. A series of in depth articles exploring and explaining the complex aspects of the childhood obesity epidemic.

Ludwig, D, Rostler, S. *Ending the Food Fight*. New York: Houghton Mifflin Company: 2007.

Taking into consideration the three key factors affecting bodyweight – biology, behavior, and environment - the author offers a prescription for helping overweight children and their parents regain control over eating and start on the road to a healthy lifestyle.

Mercer, SL, Green, LW, Rosenthal, AC, et al. Possible Lessons From the Tobacco Experience for Obesity Control. Available at <http://www.toniyancey.com/hsm242/jun03>. Accessed April 16, 2008.

This is a study that looks at what public health efforts worked in the anti-smoking campaign and how these approaches can be applied to combat the obesity epidemic.

Rimm, S. *Rescuing the Emotional Lives of Overweight Children*. Emaus, Rodale Press, Inc.; 2004.

Dr. Rimm explores the inner lives of overweight children. Through personal interviews, surveys, and her own cases, she reveals the emotional toll being overweight has on children and what parents, educators, and society can do to ease the burden on these children

Schwimmer, JB, Burwinkle, TM, Varni, JW, et al. Health Related Quality of Life of Severely Obese Children and Adolescents. *The Journal of the American Medical Association*. 2003;289:1813-1819. Available at: jama.ama-assn.org/cgi/content/abstract/289/14/1813. Accessed February 18, 2008.

This study reveals that severely overweight children have an outlook on life on the par with children who have been diagnosed with cancer and are undergoing chemotherapy.

Sears, W., Sears, M, Sears, J, et al *The Healthiest Kid in the Neighborhood*. New York: Little, Brown and Company: 2006.

The authors, all in pediatric practice and at the forefront of the childhood obesity epidemic, offer practical suggestions to parents to help them give their children a good start to a healthy lifestyle. They provide extensive information on nutrition and better, healthier ways for families to eat.

Texas Children's Hospital. *The Family Guide to Fighting Fat*. New York: St. Martin's Griffin; 2007.

The authors believe that combating obesity begins at home. Their work provides information on healthy eating and exercise options for children in every age group, as well as strategies to keep the whole family on a healthy path.

**Childhood Overweight – What the Research Tells Us*; The George Washington University Medical Center.org; <http://www.healthinschools.org>. March, 2005. Accessed February 18, 2008.

An overview of the research on the causes and health consequences related to childhood obesity.

Wiecha, JL, Peterson, KE, Ludwig, DS, et al. Impact of Television Viewing on Dietary Intake in Youth. *Archives of Pediatric Adolescent Medicine*.2006: 160: 436-442.

This is a study that shows how TV viewing and childhood obesity are linked.

**Child Obesity*; MayoClinic.com; <http://www.mayoclinic.com/health/childhood-obesity/DS00698>accessed April 16, 2008.

Practical information on the causes of obesity, with information for parents on how to proceed to help their children combat the consequences.

**Kids Poll: Students weigh In About Obesity*; Kids Health.org; www.kidshealth.org. Jan.2004; accessed February 18, 2008.

Describes what children know about obesity and how kids get that way.

**The Emotional Toll of Obesity*; Kids Health. Org; <http://kidshealth.org>.; July 2007; accessed February 18, 2008.

Student Reading List

Ganz, Sue. *Even Superheroes Get Diabetes*. Houston: Dog Ear Publishing, LLC, 2007
Comic book style illustrations, kid friendly diagrams and definitions that explain the disease. Child who loves comic books gets diabetes and a mysterious doctor discovers he has superpowers and helps the child deal with her disease.

Gerber, Max. *My Heart vs. The Real World: Children with Heart Disease, In Photographs and Interviews*. Cold Springs Harbor: Cold Springs Harbor Laboratory Press, 2008.

The book explores the lives of children with childhood heart disease through black and white photos and interviews with the children and their families.

Mackall, Dandi Daley. *Larger Than Life Lara*. New York: Dutton, 2006.

The story about the effect an unusually self-confident girl who “looks just like a big sofa” has on a class of fifth graders.

Mulder, Linnea. *Sarah and Puffle: A Story for Children About Diabetes*. New York: Imagination Press, 1992.

A story about a little girl who learns she has diabetes. Provides basic information about diabetes.

Pirner, Connie White. *Even Little Kids Get Diabetes* Morton Grove: Albert Whitman and Co., Press. 1994

Written for children who have recently learned they have diabetes. Discusses diagnostic procedures, symptoms, and treatment.

Wells, Rosemary. *The Gulps*. New York: Little, Brown and Company, 2007.

A children’s picture book aimed at introducing children to the importance of eating well.

Note: Also see Child Obesity: Mayo Clinic.com (above) as a source for students. This is a solid, readable reference for background information.

Resources

CDC Growth Charts and BMI Index Charts

www.cdc.gov/archs/about/major/nhanes/growth_charts/charts.htm

MyPyramid.com

School-based Nutrition Programs – Eat Well and Keep Moving

www.hsph.harvard.edu/nutritionsource/EWKM.html

<http://www.google.com/webmaster/google/calorie.html#ct+1056755011>.

<http://www.healthstatus.com/calculate/cbc>

Planet Health.org.

Pennsylvania State Standards addressed in this unit

Mathematics

- 2.1 Numbers, Number Systems and Number Relationships
 - 2.1C Demonstrate that mathematical operations can represent a variety of problem situations
- 2.2 Computation and Estimation
 - 2.2A Create and solve word problems involving addition, subtraction, multiplication, and division of whole numbers
- 2.4 Mathematical Reasoning and Connections
 - 2.4F Use statistics to quantify issues (e.g. social studies)
- 2.6 Statistics and Data Analysis
 - 2.6A Organize and display data using pictures, tallies tables, charts bar graphs and circle graphs
 - 2.6E Construct and defend conclusions based on data

Social Studies

- 8.3 United States History
 - Standard Statement: Why Study History?
 - Focus Question: How Do We Learn About History?
 - A.1 Primary Documents, Materials, and Historical Places

Literacy

- 1.1 Learning to Read Independently
 - 1.1A Establish the purpose for reading a type of text before reading
 - 1.1B Select texts for a particular purpose
 - 1.1G Demonstrate after reading understanding and interpretation of text
- 1.2 Reading Critically in All Areas
 - 1.2C Produce work in at least one literary genre that follows the conventions of the genre
- 1.3 Reading, Analyzing & Interpreting Literature
 - 1.3A Read and understand works of literature
 - 1.3C Describe how the author uses literary devices to convey meaning
- 1.4 Types of Writing
 - 1.4A Write poems, plays, and multi paragraph stories including narrative and memoir

- 1.5 Quality of Writing
 - 1.5A Write with sharp, distinct focus, identifying topic, task and audience
 - 1.5B Use well developed content appropriate for the topic
 - 1.5C Write with controlled and/or subtle organization
 - 1.5E Revise writing to improve organization, word choice, order and precision of vocabulary
 - 1.5F Edit writing using the conventions of language

Visual Arts

- 1.1 Understand and Apply Art Media, Techniques and Processes
 - 1.1A Select and use materials, techniques, and processes to communicate ideas, experiences, and stories
 - 1.1C Use materials in a safe and responsible manner
- 1.2 Demonstrate Knowledge of Elements, Principles and Expressive Features from Diverse Historical Periods and Cultures
 - 1.2A Describe, analyze, and evaluate characteristics of elements, principles and styles of art.
 - 1.2B Use, analyze, and evaluate elements, principles and styles of art to communicate ideas and experiences
- 1.3 Recognize, Select and Evaluate a Variety of Subject Matter Symbols and Ideas From Diverse Cultures and Historical Periods
 - 1.3A Identify and discuss subject matter, symbols, and ideas that visual images communicate
- 1.6 Use the Visual Arts and Artifacts as a Way of Understanding Ourselves and Our Community
- 1.7 Understand the Interconnection Between Visual Arts and All Disciplines