

# Reducing Obesity in Students Everywhere (ROSE): A Brief, Interactive, School-Based Approach to Promoting Health

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## ABSTRACT

*The Reducing Obesity in Students Everywhere (ROSE) health promotion presentations educate students in grades 3-12 about nutrition, physical activity, reducing screen time, sleep, smoking, stress management, and the benefits of a healthy lifestyle. This article describes the content of the presentations, how information is delivered, strategies used, and reports of what students learned and behaviors they changed. Students' evaluation surveys indicate that the brief presentations are engaging and effective in conveying health information and facilitating behavior change. At one-month follow-up, 92% of elementary school students and 88.5% of high school students reported making at least 1 healthy behavior change.*

## INTRODUCTION

Over the last few decades, the prevalence of overweight and obesity among Americans of all ages, backgrounds, races, and ethnicities has increased substantially (Flegal, Carroll, Ogden, & Curtin, 2010). Findings from national surveys reveal that 14.9% of children and adolescents are overweight and an additional 16.9% are obese (Ogden, Carroll, Kit, & Flegal, 2012). Comorbidities associated with overweight and obesity in children include elevated blood pressure, metabolic syndrome, and type 2 diabetes mellitus (Daniels et al., 2005; Weiss et al., 2004). Given that excess weight is a significant public health concern, immediate action must be taken to prevent overweight and obesity, and reduce children's risk of developing chronic conditions in adulthood.

Schools are a promising environment to foster prevention strategies. More than 54 million children attend school daily (Story, Kaphingst, & French, 2006) and teachers have been shown to effectively deliver school-based obesity interventions (Sharma, 2005). Previous research points to several important factors that should be considered when developing prevention strategies. These include interactive, developmentally appropriate methods that target physical activity and nutrition behaviors, as well as instructional procedures to reduce sedentary behavior (Sharma, 2005). Studies also show that the promotion of social and familial support can encourage and sustain participation in healthy behaviors (Sallis, Prochaska, & Taylor, 2000). Thus, with opportunities to incorporate nutrition and physical activity lessons into the curriculum (Story et al., 2006), health education efforts may translate into health benefits for American youth. Such efforts may also prompt discussion with friends and family, and lead to social support for healthy lifestyle behaviors.

The purpose of this article is to describe the implementation of the Reducing Obesity in Students Everywhere (ROSE) health promotion presentations, which are brief, age-specific, and interactive. The presentations can easily be integrated into the classroom and include up-to-date content on nutrition, physical activity, screen time reduction, sleep, smoking, stress management, healthy lifestyle benefits, and approaches to encourage family and peer involvement in the adoption of healthy behaviors.

## TEACHING METHOD

### Target Audience

The ROSE presentations are designed specifically for elementary, middle, and high school students. The information provided is conveyed to students in a manner that makes the presentations appropriate for all children, regardless of their weight status.

### Learning Objectives

By the end of the presentation, students will be able to:

1. specify the health consequences of obesity,
2. understand how the health choices they make during their youth can affect their future health,
3. provide examples of foods in each of the MyPlate food groups,
4. recognize that half of their plates should be filled with fruits and vegetables,
5. read and understand a food label,
6. describe the consequences of excessive consumption of sugar-sweetened beverages,
7. understand how fast-food companies use various marketing techniques to sell their products,

8. understand energy balance and describe the recommendations for physical activity and screen time,
9. describe ways to improve their sleep hygiene, and
10. demonstrate an understanding of the material by reporting, in writing, three things they learned from the presentation.

Students in middle and high school will also be able to:

1. describe techniques for managing stress and
2. summarize the consequences of smoking and its effect on multiple organs.

These learning objectives are consistent with several of the National Health Education Standards, including:

- 1.5.1 describe the relationship between healthy behaviors and personal health;
- 1.8.9 examine the potential seriousness of injury or illness if engaging in unhealthy behaviors;
- 2.5.5 explain how media influences thoughts, feelings, and health behaviors; and
- 2.5.6 describe ways that technology can influence personal health.

### Materials and Resources

Two online presentations are available – one for 3<sup>rd</sup>-5<sup>th</sup> graders and one for 6<sup>th</sup>-12<sup>th</sup> graders. The content is similar across the two presentations, but is modified to be age-appropriate. The middle and high school presentation incorporates additional information on smoking and stress management. To view the presentations in the intended format on the Prezi website, instructors will need: (1) a computer with access to the Internet and speakers, (2) an updated version of Adobe Flash, and (3) a projector and screen. The presentations can be found on the ROSE website:

(<http://www.psy.miami.edu/urose/resources.phtml>).

Internet access is necessary to use Prezi and view the presentation videos from the New York City Department of Health and Mental Hygiene (NYC Health) public service announcements (PSA). Alternatively, if Internet access is unavailable, the PowerPoint of the presentations with the embedded NYC Health videos can be downloaded and saved from the ROSE website ahead of time. Video clips from HBO's Weight of

the Nation documentary are also used during the presentation, and will need to be obtained in advance as they are not embedded within the Prezi or the PowerPoint presentations. The DVDs for the HBO documentary can be obtained through the website:

<http://theweightofthenation.hbo.com/films/kids-films/quiz-ed>. When using the DVDs to display the video clips, the discs can be played on the instructor's computer and projected onto the screen for the students to watch. The list of times at which the instructor can find each HBO Weight of the Nation Quiz Ed clip is included in Table 1. Instructors can deliver the presentations in classrooms or other school settings. It is recommended that the number of students be limited to 40 to encourage active participation, reduce distractions, and manage students.

Instructors will also need writing instruments for students, post-presentation evaluation surveys (Figure 1) and several props: 16 sugar packets stapled together in a chain, a 1.5-ounce bag of chips, a 20-ounce bottle of regular soda, and an 8-ounce cup. For the middle and high school presentation, handouts for the activity, "Find a Witness to Fitness," will also be needed. All surveys and handouts are available on the ROSE website.

### TEACHING PROCEDURES

#### Overview

The ROSE presentations focus primarily on the importance of adopting a healthy lifestyle to obtain or maintain a healthy weight. They provide information on nutrition and physical activity, discuss strategies and recommendations for a healthy lifestyle, and address potential barriers that may interfere with adopting and maintaining healthy habits. In addition, the presentations are discussion-based to encourage student participation, gauge student understanding, and stimulate conversation. Images, text, and videos are also included to vary the pace at which the information is presented, introduce concepts, and maintain class interest. Although it is recommended that the presentations last for 60 minutes (50 minutes for presentation and 10 minutes for the in-class assessment), they can be shortened or lengthened based on the needs of the instructor and the class.

The presentation topics and content for elementary, middle, and high school students

are outlined in and are listed in Table 2 in the order that they are presented. Table 2 also includes sample questions to ask students to encourage discussion within each content area. Below, the topics are discussed in the order in which they appear in the presentation. The topics are first described for the 6<sup>th</sup>-12<sup>th</sup> graders, followed by a brief description of how the topics are adapted for 3<sup>rd</sup>-5<sup>th</sup> graders. In addition, a description of the activities carried out during the presentations is provided.

#### Health risks

The presentation begins by illustrating how overweight and obesity impacts the lives of students and their families. In the initial activity, all students are asked to stand up. They are then instructed to sit down if they know someone who is overweight, or has a cardiometabolic-related problem for which obesity is a risk factor, such as diabetes or heart disease. After about 3 such queries, the entire class is generally in their seats and the issue of overweight becomes personally salient for the students. This activity sets the stage to discuss students' perceptions of what constitutes a healthy lifestyle and orients them to its benefits. A key message is that the small, persistent changes they make to improve their health while young can have a big payoff in the future.

After this brief activity is completed, the 90-second trailer for HBO's "Weight of the Nation" documentary is shown to provide a brief and powerful overview of the obesity epidemic (see Table 1). This is followed by a discussion of the surprising facts students learned about the prevalence of overweight and obesity in American youth and the comorbidities associated with excess weight.

In contrast, the presentation for 3<sup>rd</sup>-5<sup>th</sup> graders begins with the query, "What does it mean to be healthy?" This discussion covers the importance of eating a balanced diet, being physically active, and obtaining sufficient sleep every night. Once these three topics are mentioned, the presentation segues to the nutrition segment.

#### Healthy eating

Given that proper nutrition is essential for good health, the presentation's nutritional content provides students with the tools necessary to make healthy dietary choices. Nutrition is introduced with a discussion of food

as fuel/energy, emphasizing the importance of nutrient-rich food in moderate quantities and making smart dietary choices. Several nutrition-related topics are presented including: a) the United States Department of Agriculture's MyPlate guide to food groups, recommendations for healthy choices, and serving sizes; b) the importance of a nutritious breakfast for optimal school performance; c) marketing strategies used by companies to promote fast food products and junk food; d) making healthy choices when eating out; e) understanding nutrition labels, and nutrient and caloric content of food items; f) healthy alternatives to drinking high-calorie, sugary beverages; and g) the benefits to eating healthy foods.

During this section of the presentation, engaging excerpts from the HBO's "Weight of the Nation Quiz Ed" documentary and the NYC Health videos are used to support the content (see Table 1). For example, a PSA demonstrating how high sugar intake can lead to type 2 diabetes, an increased risk for cardiovascular complications, and even some cancers reifies the risks of excessive sugar intake. Demonstrations are also included to highlight the sugar content in a variety of beverages. For example, students are shown a chain of 16 sugar packets that are fastened to one another like a rope to illustrate how much sugar is in a typical 20-ounce bottle of soda. Two planned activities, 'Guess the Grub' and 'Think Before You Drink,' are also used to increase awareness and reinforce students' understanding of nutrition labels and beverage choices, respectively. Another helpful demonstration involves presenting the class with a typical 1.5-ounce bag of potato chips and asking them to guess the serving size and number of servings per container.

The same nutrition related concepts are covered in the elementary school adaptation; however, there is an additional demonstration, 'What is Missing from MyPlate?' where a volunteer from the class comes up to the board to illustrate how a meal could be improved to be more in line with MyPlate recommendations. Furthermore, the first NYC Health video, 'Do You Drink 93 Sugar Packets a Day?' is removed and substituted with 'How Many Sugar Packets Are in One 20-ounce Bottle of Soda?' (see Table 1). In addition, two videos, 'What kind of skipping makes you gain weight?' and 'How can you gain weight without eating?,' from HBO's

'Weight of the Nation Quiz Ed' are included to stimulate discussion among the students and illustrate the importance of eating all three meals (see Table 1).

### Energy Balance

Healthy weight management is a function of balancing calories consumed through food and beverages with calories expended through physical activity (and other normal bodily functions). To demonstrate the concept of energy balance, students are asked, "What happens if there is too much energy in and not enough energy out?" Students are taught that weight is a) maintained if calories consumed are equal to calories expended, b) gained if calories consumed exceed calories expended, and c) lost if calories expended exceed calories consumed. The NYC Health videos are used to illustrate how much activity would need to be done (e.g., how far would one need to walk) to achieve energy balance (see Table 1).

In the elementary school adaptation, the NYC Health videos are replaced with HBO's Weight of the Nation clips. These videos demonstrate how much activity is required to burn the calories from foods commonly consumed (see Table 1).

### Physical Activity

As children increase in age, their physical activity decreases (Caspersen, Pereira, & Curran, 2000). This section on physical activity begins by asking students, "What do you do to stay active?" This serves as an introduction to the 'Find a Witness to Fitness' activity that demonstrates how classmates stay active (see below). Next, the presentation addresses ways to incorporate physical activity into daily routines. Students are also told that it is recommended that they get an hour of physical activity every day, and the four types of activity they should engage in (stretching, aerobic, muscle strengthening, and bone strengthening activities) are explained. In addition, the benefits of being physically active every day are discussed.

The 'Proving I'm Moving' activity describes the four types of physical activity. The health and wellness benefits of physical activity are also discussed. For example, brain scans showing brain activity before and after exercise illustrate the potential benefits of physical activity for cognitive function and school performance. In

addition, strategies to address barriers to a physically active lifestyle and reduce sedentary behavior (e.g., television watching, playing video games) are discussed. HBO's Weight of the Nation Quiz Ed video, 'How can you play a sport without exercise?', provides alternatives to playing video games, in efforts to limit screen time in children and adolescents, such as playing sports or going outside with friends.

For the elementary school adaptation, the HBO's Weight of the Nation video, 'What is the best way to burn off fat?' replaces the 'Find a Witness to Fitness' activity.

### Sleep

Short sleep duration is associated with excess weight in youth (Cappuccio, Taggart, Kandala, & Currie 2008). As such, providing education about sleep hygiene to students at a young age may be valuable in preventing overweight and obesity. To demonstrate the prevalence of short sleep duration, instructors begin this part of the presentation by asking the entire class to stand up. Students are then asked to sit down if they slept for 10 or more hours last night, followed by 9 hours, 8 hours, etc., until all students are seated. This activity provides a context to address the optimal duration for each individual and to discuss the causes of insufficient sleep, as well as possible solutions. The importance of sufficient sleep for health, obesity prevention, learning, and emotional well-being is also discussed. For example, a clip from 'Weight of the Nation' entitled 'Would you gain more weight sleeping five hours a night or eight hours?' illustrates how insufficient sleep contributes to poor food choices and affects health. Sleep hygiene tips are also presented to educate students on how to promote a healthy sleep pattern.

### Smoking

Smoking remains the leading cause of preventable death in the US (Samet, 2013). To introduce the section on smoking, the prevalence of this behavior among youth and tobacco-related mortality rates are presented. The physiological effects of nicotine on the cardiovascular system and the adverse effects of smoking on cardiovascular health are conveyed using an infographic of the human body. This infographic is a visual representation of the chronic illnesses and types of cancer associated with smoking cigarettes.



### Stress Management

Stress is pervasive and is experienced by people of all ages. Furthermore, stress has measurable effects on the cardiovascular system (Chrousos, 2009) and is known to disrupt healthy lifestyle behaviors related to nutrition and physical activity (Michels et al., 2012; Stults-Kolehmainen & Sinha, 2014). Students are polled about their experience of stress and their common sources of stress. The class is then encouraged to discuss healthy stress management tips and problem solving skills.

### Healthy Lifestyle Benefits and Tips

The presentations conclude with a summary discussion of benefits associated with healthy lifestyle behaviors related to good nutrition and increased physical activity. In addition, the following healthy lifestyle tips introduced throughout the presentations are reiterated. For healthy eating, students are advised to a) make half their plate fruit and vegetables according to MyPlate recommendations, b) eat the rainbow (i.e., colorful fruits and vegetables), c) eat breakfast, lunch, and dinner, d) eat junk food infrequently, and e) drink water rather than sugary drinks. For physical activity, students are told a) to spend less than 2 hours per day in front of a screen (e.g., watching television or playing video games), b) that they do not need to be vigorously active all the time, they just need to be active, c) to be active or play at least an hour per day, d) to get more fit time and less sit time, and e) that small changes now can have big benefits later.

### Ending the lesson

At the end of the presentations, students are invited to ask any additional questions they may have about the information they heard. Afterwards, students are asked to complete a post-presentation evaluation survey (see Assessment section below).

### Activities

The activities embedded in the presentation address: 1) eating balanced meals, 2) nutrition labels, 3) sugary drinks, 4) accessible ways to be physically active, and 5) physical activity modeling.

### What is Missing from MyPlate?

Elementary students are asked to make a dinner plate “healthier” by adding the appropriate food groups that are missing from

the meal. A student is selected to draw the foods suggested by his/her peers on the board to visually represent how to improve the meal so that it is consistent with MyPlate recommendations.

### Guess the Grub

The nutrition label activity is completed after instructions are provided on how to read and understand food labels. Two unidentified nutrition labels are presented (high fiber cereal and french fries) and students are asked to guess what the food items are. This activity calls for students to apply what they learned about reading a nutrition label, assessing nutritional content, and determining whether an item is a healthy option. This activity also reinforces students’ understanding of the nutritional composition of regularly consumed items.

### Think Before you Drink

This activity occurs after the students learn about added sugars in fruit drinks and the amount of sugar in soda. Images of a regular soda, a sports drink, a frozen coffee beverage, and a fruit drink are presented. The class is asked to guess which beverage holds the most and least amounts of sugar. After students have ‘voted’, the sugar content of the beverages is visually revealed. This activity raises awareness about common sources of excess sugar in students’ diets and the impact of excess sugar on weight.

### Find a Witness to Fitness

Approximately halfway through the presentation, the instructor presents ‘Find a Witness to Fitness.’ The activity provides an opportunity for students to stretch and learn about their classmates’ physical activity. The activity applies the common “human bingo” ice-breaker approach to learning what classmates do to be active. All students are given a sheet displaying a grid with 16 boxes. In each box, an activity is listed (e.g., completing active chores, bike riding, walking the dog). The students have 3 minutes to obtain signatures from 16 different individuals in the classroom who have participated in the listed activities. The activity is concluded by talking about the many easy and accessible ways to be physically active.

### Proving I’m Moving

The ‘Proving I’m Moving’ activity is introduced during the discussion of types of physical activity. First, the instructor recruits 2

volunteers who come forward. Next, the class is asked what they know about each of the types of physical activity (e.g., aerobic, muscle strengthening, and bone strengthening). Students with the correct description then choose an example of that type of physical activity for the volunteers to demonstrate (e.g., running in place for aerobic activity, push-ups for muscle strengthening activity). This activity underscores the importance of meeting daily physical activity recommendations by including different types of activities.

### **ASSESSMENT PROCEDURES AND EVALUATION RUBRIC**

The effectiveness of the presentations can be assessed using the Health Knowledge and Behavior Change rubric provided in Table 3. At minimum, we recommend that students be given a post-presentation evaluation survey to complete (available at the ROSE website <http://www.psy.miami.edu/urose/resources.phtml>). This survey asks students to list 3 things learned from the talk as well as what they plan to do to be healthy. An optional one-month follow up survey also can be given, and the length of follow-up can be modified based on teacher and student needs (available on the website). The responses from the surveys can be used to determine students' level of success in retaining health knowledge content and engendering behavior change.

An additional assessment option is to instruct students to set a healthy behavior change goal and keep a log of their health behavior change for 2 weeks or longer to self-monitor their progress toward their goal. Self-monitoring increases awareness and is an effective way to improve the likelihood of sustained behavior change (Elder, Ayala, & Harriss, 1999). Teachers can reinforce and encourage behavior change and assist students with any problems that arise. Furthermore, teachers are also free to adapt the assessment and/or replace the assessment with strategies that are suitable to their needs.

### **RESULTS**

The ROSE presentations have been given to over 8,000 students. We assessed what students learned, whether they enjoyed the presentations, and what they planned to do to improve their health behaviors. Virtually all

students rated the presentation favorably and reported that they found it interesting and enjoyable.

To examine whether students actually changed their health behaviors after the presentation, 227 elementary (ages 8-13) and 182 high school (ages 13-18) students completed post-presentation surveys and one-month follow-up surveys, which assessed health behavior change. Overall, students reported enjoying the lesson. Specifically, 90.9% of the elementary and high school students reported that they liked the presentation and 87.7% reported that the presentation was interesting.

### **High School Outcomes**

Findings revealed that after a ROSE presentation, 98.4% of high school students reported learning at least one thing from the presentation (recall they were asked to list up to 3 things that they learned from the presentation). At one-month follow-up, 86.8% of the high school students reported remembering specific material. Upon the completion of the presentation, 98.9% of students intended to make a health behavior change. Of those students, 88.5% reported making a change 1 month later. Students reported improving their nutrition, increasing physical activity, reducing screen time, and improving sleep and general health habits (see Table 4).

The majority of the students reported receiving social support in their efforts to make a healthy behavior change. In fact, of those students who were successful in making a healthy behavior change, 75% reported they received support from a parent or siblings. Furthermore, the high school students' self-reported health status increased at follow-up; 48.9% of students reported their health to be 'very good' or 'excellent' at follow-up compared to only 31.3% immediately after the presentation.

### **Elementary School Outcomes**

The results for elementary school students were similar to those found among high school students. Results indicated that 95.6% of elementary students reported learning at least one thing from the lesson. At one-month follow-up, 91.2% of students remembered at least one thing from the presentation. While 90.3% of the students planned on making a health behavior change after the lesson, at one-month follow-up,

92% reporting making some type of healthy change. Similar to the high school aged children, 71.4% of elementary school students reported receiving familial support when making a change.

## DISCUSSION

Our experience demonstrates that the ROSE presentations are an effective means of promoting and facilitating health behavior change among elementary, middle, and high school students. The presentations also significantly impact health knowledge, as was evidenced by the large number of students learning and retaining information about the major themes in the presentations. Students' high level of interest in and enjoyment of the presentations may have contributed to their ability to retain key concepts and take steps to change their behavior. In addition, the finding that a large number of students received assistance from their families to change their behavior points to the importance of support in behavior change and the ability of students to extend what they learned in the classroom to their homes. Together, the student evaluations support the effectiveness of the ROSE presentations and suggest that it may be a promising approach to utilizing the classroom environment to foster obesity prevention efforts in a manner that is interactive and engaging.

Although the evaluations of the ROSE presentations are favorable, there are a few areas in need of further examination. In particular, assessing students on more than two occasions to determine what information they remember from the presentation over a longer period of time is warranted. Furthermore, examining whether changes in students' behaviors are maintained in the long-term would be important to demonstrate that this brief intervention has a positive, lasting impact on students' health habits. While these areas of future work are important for extending our findings and the value of the ROSE presentations, the findings suggest that a brief, interactive, and engaging presentation can be delivered in a classroom setting and lead to health-enhancing behavior changes in the short-term.

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**Figure 1: Rose Post Presentation Survey**

**ROSE Survey**

**Please circle the answer that best matches how you feel about today’s talk.**

1. How much did you like today’s ROSE lesson?  

I liked it a lot	I liked it	In the Middle	I didn’t like it	I really didn’t like it
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2. How interesting was today’s lesson?  

Very Interesting	Interesting	OK	Boring	Very Boring
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3. Was this lesson useful to you?  

Very	Somewhat (In the middle)	Not At All
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4. How would you describe your health? My health right now is:  

Excellent	Very Good	Good	Not So Good	Bad
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5. Do you consider yourself fat around the waist?  

Very	Somewhat (In the middle)	Not At All
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6. List 3 things you learned from today’s lesson.  

1)	_____
2)	_____
3)	_____
  
7. What do you plan to do to be healthy?  

1)	_____
2)	_____
3)	_____
  
8. How sure are you that you will make a healthy change?  

Very Sure	Kind of Sure	Not Sure
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9. Are you going to tell your family about what you learned today?  

a.	Yes
b.	No

**Table 1: Lesson Videos by Topic**

Topic	Video Title	Message Received	3-5 <sup>th</sup> grade	6-12 <sup>th</sup> grade
<b>Health Risks</b>	Weight of the Nation Trailer	2/3 of American adults are overweight and obese, and 1/5 of kids are obese.		✓
<b>Nutrition</b>	Weight of the Nation Quiz Ed: What kind of skipping makes you gain weight? 18:52-19:42*	Eat breakfast, lunch, and dinner.	✓	
	Weight of the Nation Quiz Ed: What's red and yellow and makes you hungry all over? 26:13-28:05*	Fast food companies use neuro-marketing to appeal to customers.	✓	✓
	NYC Health: How Many Sugar Packets Are in One 20-ounce Bottle of Soda?	Shows how much sugar is in one serving and how many servings is typically consumed.	✓	
	NYC Health: Do You Drink 93 Sugar Packets a Day?	High sugar intake may lead to an increased risk of type 2 diabetes, cardiovascular complications, and even some cancers.		✓
	Weight of the Nation Quiz Ed: How can you gain weight without eating? 9:52-10:21*	Drinking sugary drinks can lead to weight gain.	✓	
<b>Energy Balance</b>	Weight of the Nation Quiz Ed: How long does it take to swim off a bag of chips? 5:03-5:49*	Activity levels needed to burn off fast food vs. vegetables.	✓	
	Weight of the Nation Quiz Ed: How many stairs do you need to climb to burn off a can of soda? 10:22-11:25*	How much activity is required to burn off a 10-ounce. can of soda.	✓	
	NYC Health: Are You Pouring on the Pounds?	Energy balance over time can help maintain a healthy weight.		✓
	NYC Health: Man Walking Off Soda	How much activity is required to burn off calories.		✓
	Weight of the Nation Quiz Ed: How can you burn food without cooking? 0:59-1:40*	Exercise is a way to expend calories consumed.	✓	
<b>Physical Activity</b>	Weight of the Nation Quiz Ed: What's the best way to burn off fat? 28:59-30:08*	There are many ways that we can become physically active.	✓	
	Weight of the Nation Quiz Ed: How can you play a sport and not get any exercise? 6:02-7:03*	Playing video games contributes to excessive screen time and low activity levels.	✓	✓
<b>Sleep</b>	Weight of the Nation Quiz Ed: Would you gain more weight sleeping 5 hours a night or 8 hours? 23:11-23:51*	Not sleeping enough can lead to compensating for that lack of energy with more calories.	✓	✓
<b>Health Lifestyle Benefits</b>	Weight of the Nation Quiz Ed: How can you do better in school without studying more? 16:53-18:51*	Physical activity may increase blood flow in the brain.	✓	

Note: \*Indicates the time stamp for Weight of the Nation Quiz Ed videos.

**Table 2: Lesson Topics and Discussion Probes**

Topic	Example Content	Sample Probe
<b>Health Risks</b>	Statistics	What percentage of children is obese?
	Comorbidities	What chronic illnesses are associated with overweight and obesity?
<b>Nutrition</b>	MyPlate	What proportion of a plate should be fruits and vegetables?
	Food groups	What is the difference between whole and refined grains?
	Fast food marketing	What are the two colors that make you hungrier and eat faster?
	Healthy options when eating outside the home	What could you drink instead of soda at a fast food establishment?
	Food labels	What is the first thing you should look at when reading a food label?
	Soda consumption	What is found in soda that is unhealthy for us?
<b>Energy Balance</b>	Balancing energy to maintain a healthy weight	What would happen if there is too much energy in and not enough energy out?
<b>Physical Activity</b>	Adding physical activity into daily routine	What are the different ways one can be active?
	Recommendations	How long should one be physically active for every day?
	Types of physical activity	What are the four types of physical activity one should do?
	Screen time	What is the maximum amount of time one should spend in front of a screen?
	Barriers to a physically active lifestyle	What are some reasons you're not as physically active as you would like to be?
<b>Sleep</b>	Recommendations	How long should you be sleeping at night?
	Sleep hygiene tips	What are some things you can do to make sure you sleep enough every night?
	Importance of sleep	Why is sleep important?
<b>Smoking Avoidance</b> *	Data about smoking	How many deaths are due to smoking related causes every year?
	Consequences	What are the health risks associated with smoking?
<b>Stress Management</b> *	Stress management tips	What are some ways we can manage stress?
<b>Healthy Lifestyle Benefits</b>	Short-term benefits	How might being physically active help you in school?
	Long-term benefits	What are the chronic illnesses that a healthy lifestyle can help prevent?

Note: \* Topics only covered with 6<sup>th</sup>-12<sup>th</sup> grade students.

**Table 3: Health Knowledge and Behavior Change Rubric for Students**

	<b>Unacceptable</b>	<b>Acceptable</b>	<b>Accomplished</b>
<b>Obtained Health Knowledge (Post-Presentation Evaluation Survey)</b>	The student gave no response to the question "List 3 things you learned from today's lesson."	The student gave one response to the question "List 3 things you learned from today's lesson."	The student gave two or more responses to the question "List 3 things you learned from today's lesson."
<b>Planned Behavior Change (Post Presentation Evaluation Survey)</b>	The student did not indicate any plans to do anything in order to be "healthy" after the lesson.	The student indicated one thing they plan to do in order to be "healthy" after the lesson.	The student indicated two or more things they plan to do in order to be "healthy" after the lesson.
<b>Achieved Behavior (Follow-up Survey-Optional)</b>	The student answered "no" to the question "Did you try to do anything to be healthy after the lesson?" The student also listed no changes in response to the question "If you tried to do something to be healthy, what did you do?"	The student answered yes to the question "Did you do anything to be healthy after the lesson?" The student also listed one change in response to the question "If you tried to do something to be healthy, what did you do?"	The student answered yes to the question "Did you do anything to be healthy after the lesson?" The student also listed two or more changes in response to the question "If you tried to do something to be healthy, what did you do?"
<b>Retained Health Knowledge (Follow-up Survey-Optional)</b>	The student gave no response to the question "List 3 things you remember from the lesson."	The student gave one response to the question "List 3 things you remember from the lesson."	The student gave two or more responses to the question "List 3 things you remember from the lesson."



**Table 4: Lesson Content Remembered and Behavior Change after the Lesson and at 1-month Follow-up**

High School Students' Survey Responses	Percent (%); (N=182)	
	Post-lesson	1-month follow-up
<b>Gender</b>		
Boys	42.5	-
Girls	57.5	-
<b>Self-rated health</b>		
Excellent or very good	31.3	48.9
Good	62.1	47.8
Not so good or bad	6.6	3.3
<b>Topics learned/remembered from talk</b>		
Learned/remembered at least one thing	98.4	86.8
Learned/remembered nutritional info (e.g., MyPlate, food labels)	85.2	75.8
Learned/remembered physical activity info (e.g., energy balance)	30.8	31.3
Learned/remembered health related risks, outcomes and statistics (e.g., health implications of the obesity epidemic)	33.5	31.3
Learned/remembered the health benefits of sleep (e.g., how to improve sleep hygiene)	44.0	8.8
Learned/remembered junk food marketing techniques (e.g., colors used to attract customers to junk food products)	15.4	14.8
Learned/remembered the health benefits of limiting screen time (e.g., recommendations for daily screen time)	6.0	0.5
<b>Healthy Behavior Planned/Implemented</b>		
Planned/Implemented at least one healthy behavior	98.9	88.5
Improve eating habits	92.9	53.3
Be more physically active	83.5	37.9
Reduce screen time	9.9	1.1
Improve sleep habits	36.8	2.7
Try to improve health habits	4.4	3.3
Reduce fast food consumption	1.1	-