

# **GET MOVING!**

## **Solutions to the Epidemic of Childhood Obesity**

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By  
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What happens when kids spend hours every day watching TV or playing video games? Could these behaviors lead to obesity and serious illness? And, if so, what can we do about it?

Omar Aboulez, a fifth grader at the Flagg Street School in Worcester, Massachusetts was intrigued by this problem and decided to learn more about it for his school research project, as he explains in his written introduction to the project:

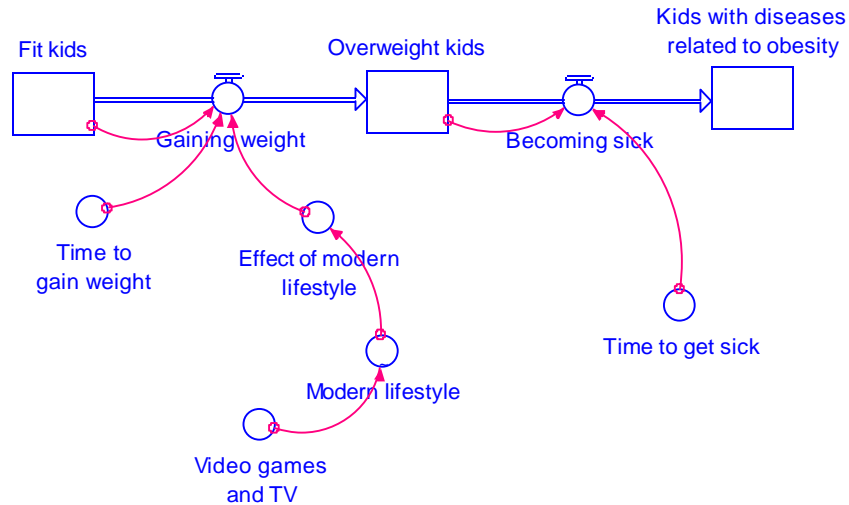
*I decided to do this project because due to the expansion of technology and our modern ways of life, kids have been doing less fitness activity. The less activity kids get, the more weight they gain, and the more weight they gain, the higher the risk of diseases related to obesity will get. I do not want my kids to grow up to be lazy and fat, and I don't want them to get horrible diseases like heart disease and diabetes, and I am sure nobody wants their kids to be like that either. So I decided to research and find solutions to this problem.*

*I will be using the System Dynamics tool to solve this problem. I chose the System Dynamics tool since it really makes you think and use logic, and I also get to use a really cool software on the computer. I was introduced to this tool by my dad; he is doing a Ph.D. on System Dynamics at WPI (Worcester Polytechnic Institute). I also went to a System Dynamics program for kids [DyamiQuest], which was really interesting.*

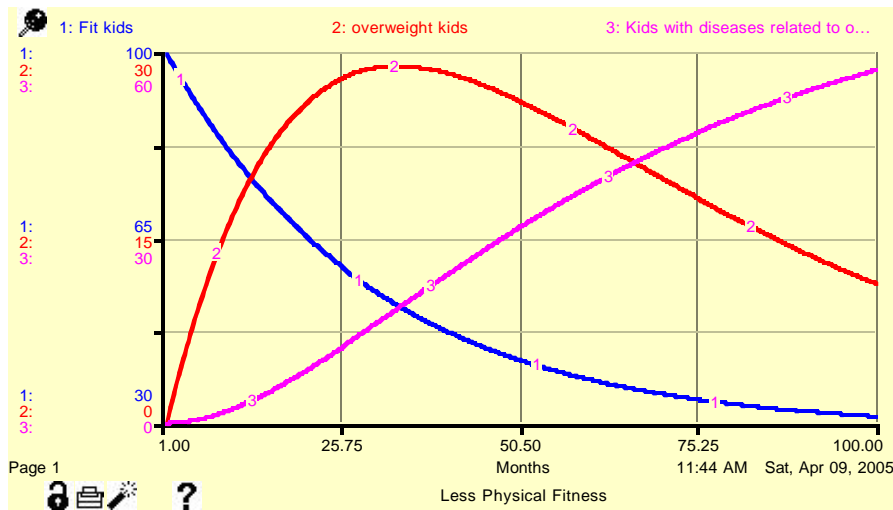
Omar's interest in fitness was piqued by his own personal experience. When he first moved here from his native Egypt in the second grade, he spent much of his time playing video games. However, when he started the fourth grade in a new school, his new classmates urged him to join in the playground games. The more he played, the more he enjoyed it. He noticed that while he was becoming more physically fit and skilled at sports, he was also having more fun with his friends and feeling healthier.

Omar's dad, Mohamed, recommend that he begin the project by framing the problem with a graph sketching his "mental model" of how childhood fitness and obesity had changed over time. Next, Mohamed explained the concept of stocks and flows and taught Omar how to use STELLA© software. As Omar did his research and worked on his model, he turned to his dad for technical help, but Mohamed is quick to point out, proudly, that this was Omar's project.

Omar's first model diagram presents his theory of how inactivity can lead to obesity and illness. Fit kids become overweight kids over time if they sit around watching TV and playing video games. With time, these kids develop obesity-related health problems. Kids progress from one stock to the next, causing the number of fit kids to decline as the numbers of overweight and obese kids rise.



Omar’s model produced the following graph. It replicated his first reference behavior sketch of the problem – childhood fitness is falling while obesity is rising. Initially all the kids were in the stock of “Fit kids.” As they gained weight over time, these kids moved into the stock of “Overweight kids” causing that line on the graph to rise. The number of “Kids with diseases related to obesity” rose slowly as overweight kids became sick and moved into that stock over time.



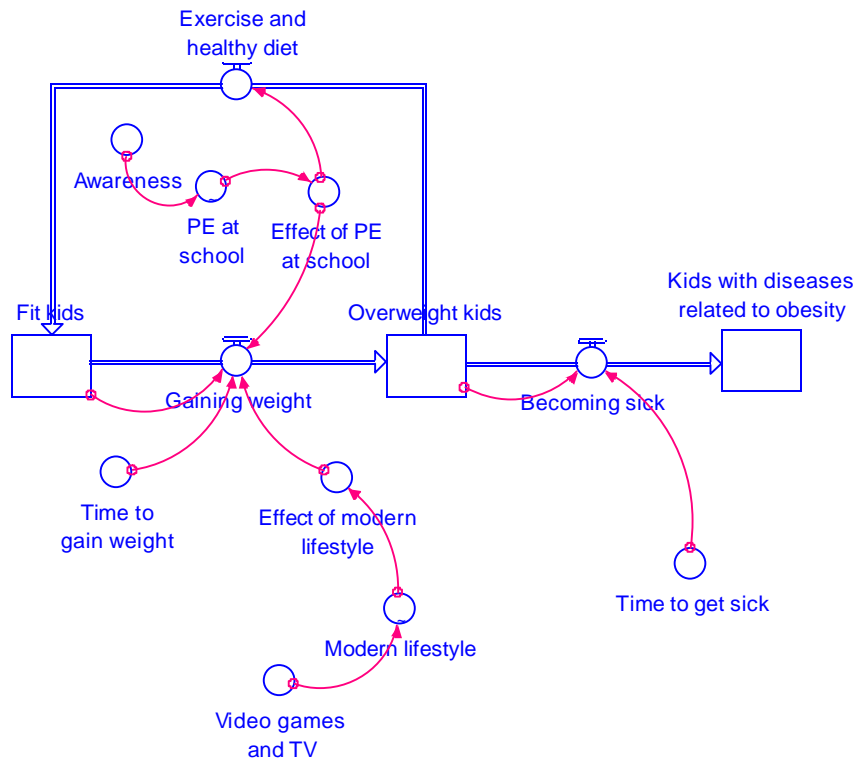
Omar writes about this alarming trend in his project:

*There are many reasons that kids are becoming overweight and getting less physical activity. The main cause of overweight among children and getting less physical activity is that video games, the computer and the television are taking up more and more of kids’ free time. Kids are becoming very addicted to them today. Most of the kids today are at their living rooms, staring at the television lying on their couches like lumps, eating chips. Watching television for five hours a day is not good for your health. Another cause for getting obese and having less physical activity is that schools are not having daily physical education classes.*

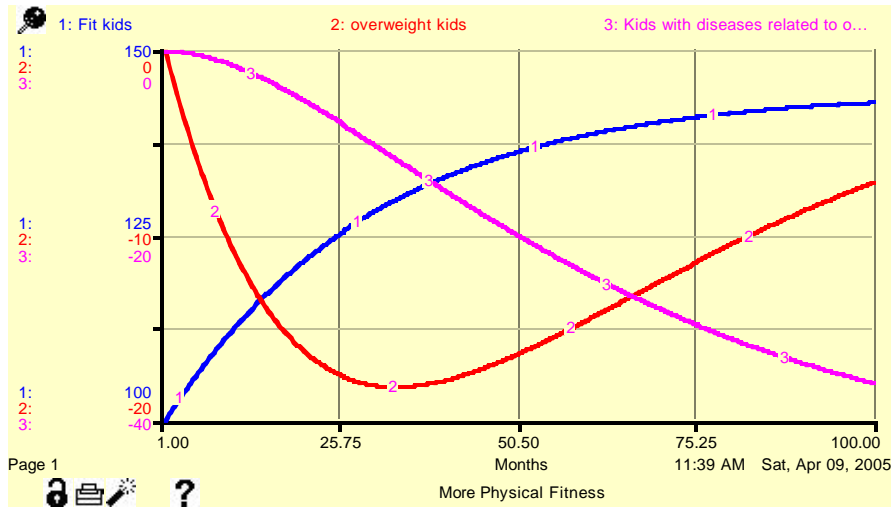
*Also, technology and our modern daily life are causes of overweight among children. Cars, for example, are taking the effort and physical activity out of walking. Elevators and escalators are greatly taking the effort out of walking up and down the stairs.*

*This problem has become an epidemic among children. The number of children that watch 5 hours or more a day has increased greatly in the past few years. Inactivity increases the risk of diseases related to obesity such as cancer, diabetes, high blood pressure, strokes and heart disease. Inactivity also makes kids lazy and often tired. Overweight children grow up to be obese adults. I would rather be physically fit and you should too.*

What to do? Omar’s research found that kids need more physical activity and proper nutrition. Using his model to test that hypothesis, he added “Awareness” of the problem leading to more physical education classes in school. (That awareness could be raised directly by the growing number of “Kids with diseases related to obesity,” a feedback loop that Omar might build into his next model.) If overweight kids get more exercise and eat well, they can become fit kids again.



The new output shows a much more optimistic scenario. Now the number of overweight kids declines and the number of fit kids grows. Best of all, there are fewer and fewer obese kids with serious illnesses. (Although the model may raise a few technical system dynamics questions, it is a very impressive start for a fifth grader!)



At school, Omar gave an oral presentation about the fitness problem and possible solutions to his class and a panel of judges. His large colorful poster displayed the model diagram, output graphs, and written explanations included in this article, plus pictures of children engaged in a range of physical activities. He also introduced the class to system dynamics. This is his written explanation:

*System Dynamics is a method for studying the world around us. It studies social problems in a scientific way. Everything goes in “feedback” loops, which means everything affects each other – if anything changes the other changes too. For an example, money in the bank earns interest, then it increases the bank account and now the account is larger, then the money earns more interest, which adds more money to the account and it goes on and on.*

*System Dynamics helps me understand how objects affect each other. It makes me understand what the problem can lead to. It makes me understand the problem by building a model (which is like a graph) on a computer. It also takes advantage that the computer solves much more complicated and confusing problems than the mental model of a human mind.*

At first, Omar says, classmates seemed confused by the model, but after he explained more thoroughly how the stocks and flows work, what the connections mean, and what caused the behavior in the graphs, they understood.

Omar’s project concluded with these solutions to the problem of childhood obesity:

*There are many ways to fight this epidemic. Children need to consume enough calories to provide them with energy to be active. The United States and many health professionals recommend that children participate in thirty or more minutes of physical activity on most days of the week. Adults should encourage their kids to move for the fun of it. You should participate in many physical activities with your family. Outdoor activities give kids an opportunity to use up*

*their energy and it builds confidence for them. You should work at your own level of sports activity and you should also join a team. Get involved in school sports, dance classes or gymnastics. If your school doesn't have sports, try community resources like the YMCA, the JCC and local parks. If you are a kid who doesn't like team sports try biking, walking or hiking, skating or swimming. Even in the evenings if you have time, go for a walk. You could (at least) go out after dinner and play a game of catch with dad, jump rope or hopscotch. Other active chores can also get kids moving such as raking leaves, washing the car or the windows, sweeping and vacuuming, walking the dog (he/she also needs to be active) and simple gardening.*

*Kids who are very resistant to outdoor activities could try exercise video tapes; there is a wide selection of these tapes. Sit ups, push ups and lifting small weights are great ways to exercise and they keep your muscles strong. Being in good shape gives you a strong heart and strong lungs. You need to do aerobic exercise two or three days a week and each activity should be at least thirty minutes. It is very important that you include physical activity in your daily life. Exercise is a great way to reduce stress and relax and when you reduce stress, it helps in preventing diseases. Yoga is a great way to relax, stretch and strengthen your muscles. Other sports do that too such as tae-kwon do, karate and ballet. Doctors say that you should never stop exercising! Even older adults who use walkers or wheel chairs should do some simple exercising. Physical activity will help them feel better, it will keep their muscles from getting stiff and it will also make them develop better balance, which will keep them from falling. Jump roping is a fun way to get kids moving. Try to walk to places with your friends instead of taking a ride.*

Omar says that he really enjoyed doing this project and plans to continue with both his physical activities and system dynamics because "System dynamics is a great way to solve problems." Although Omar loves sports now, he admits that he still likes to play video games once in a while. He urges everyone to get up and get moving! Omar can be very proud of his project and of the prize ribbon he very justly earned for it.