

PLAYBILL

A Classroom Dilemma: Why Do Children Hate **MATH?**

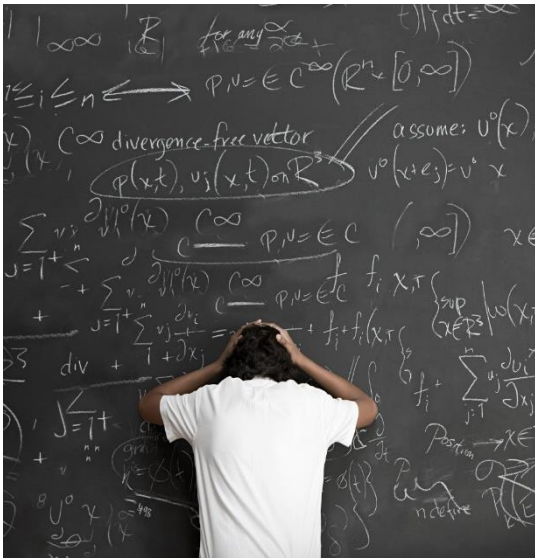


Photo found at <http://blog.marketo.com/2014/08/113-how-partner-marketing-defies-the-laws-of-math.html>

A Two Act Play

Characters:

- Simon- High School freshman who struggles with math
- Alice- Simon's friend who shares his math class
- Mrs. Matic- Simon's geometry teacher
- Mom- Simon's Mother
- Dad- Simon's Father
- Classroom - Other students in Mrs. Matic's classroom
Students

Directed By:

Logan Cole

Produced By:

Mrs. Connolly

Special Thanks To:

English 8A/ ENG 102

Dear Audience,

I love math. I think that it is an extraordinary subject and all of the concepts seem to click in my head. Unfortunately, there are many people who dislike it and think that it is hard to understand. It is difficult for me to comprehend this mentality so I asked the question "Why do children hate math?" I wasn't looking for the normal answers of "It's just hard" or "Math is stupid." I was looking for the real reasons why math is easy for some, but hard and painful for most.

Many of my friends and classmates suffer from this hatred of math, and I want to understand them better. I also want to find out if there are solutions to their mathematical problems. The events in this project and some of the actions taken by the characters are heavily influenced by my own experiences and the people around me. I will attempt to mimic the thought process of someone who "hates math" using the knowledge I have gained through working with these people.

I decided to write this project in the form of a play due to the excessive amount of time I have spent in theater working as an actor. Theater holds a meaningful place in my heart and I dedicate this paper to my high school theater department just as much as I dedicate it to all of the people who struggle with math.

Sincerely,

Logan Cole

Math Class, Yuck!

It was the first day of school in Mrs. Math's freshman geometry class. Mrs. Math walked in just as the bell rang and exclaimed, "WHO'S READY TO LEARN SOME ARITHMETIC!" But instead of being greeted with the cheers and the "whoop whoops" that the school mascot receives, she was slapped with a massive "groooooooooooooaan."

Just like the years before, her class seemed to despise math. She could hear her students saying things like "Math is so hard," "I've heard this class is awful," and "Back when my parents were in high school, they both failed this class with big F's." Then one student spoke up and said, "Math isn't that hard guys, and maybe this will be easier than past years." Much to Mrs. Math's distress the class rebuked the student with insults. One student shouted "You like math, what a NERD!" Another one offered "You have to be mentally insane to enjoy math class."

At this point Mrs. Math was through with her unruly class and took the reins. "Okay class, that is enough with the comments, it is time to learn" she said. She continued with "Math has many practical applications in the world, especially in my class that explores the uses of shapes. Some of these uses include architecture and pizza cutting, so you all should try to like math a little better." The first day was off to a rough start.

Halfway through the semester, Mrs. Math could tell that only a handful of students were doing well. The majority of her classroom was not adapting to the new concepts well and were about to give up hope in her class. The student who originally said she liked math was trying to help her classmates understand the lessons as well as she could, but she was having no luck.

"Okay class, today we are going to work in groups to explain why the formula for the volume of a cylinder is what it is. I have assigned groups based on previous test scores and your group cooperation will be counted as a quiz grade," Mrs. Math said one day. She was met with the usual groan, but she ignored it and handed out cylinder models and scratch paper. She wrote the formula on the board and assigned the groups. Just before everyone started to work

she said, "The first two groups to come up with a reason will get extra credit points on the next test." And then the class began working.

Towards the end of the period her students were beginning to panic, none of them had figured out a reason yet. Mrs. Math told them they would have two more days in class to work on a solution, and class was dismissed.

On the third day of the assignment, all but two of the groups in Mrs. Math's class had found a solution. She had even heard her students talking about how cool the assignment was, and how they understood the formula better because they could see the application. Mrs. Math learned that not all of her students understand math the same way, and some need to look at problems from a different angle.

Act 1 Scene 1²

(It is a Wednesday in Mrs. Matic's freshman geometry class. Mrs. Matic stands in front of her class at a chalk board and her students are spaced throughout the room at their desks. Simon and Alice are sitting side by side sharing a calculator.)

Mrs. Matic: Okay class, your homework is due by the end of the period and I will not accept late work! You may work in pairs if you wish, but everyone will be required to turn in their own copy of the work.

Student 1: I'm glad I did almost all of this last night! Looks like I have an easy class today.

Student 2: Me too, but I still have ten problems left, can I see your answers?

Simon: I haven't even started on my homework yet! How am I supposed to finish all fifty problems by the end of class?

Alice: You know Simon, Mrs. Matic did assign these problems two days ago.

Simon: I know I know, but I didn't understand how to work them out and I was hoping a few extra days in class would help me figure it out.

Alice: Have you asked Mrs. Matic for help outside our class?

Simon: Well....I.....errrrr.....

Alice: Exactly, how do you expect to pass geometry if you don't ask for help?

Simon: You don't have to ask for help to do well on the homework!

Alice: Ummm I.....

Simon: See math is stupid! And since I can't figure it out, it must mean I'm stupid too.

Alice: You aren't stupid! You just need a little more help and time to understand the concepts. I'm sure if you asked for help you would understand it better.

Simon: Well, I have asked you for help.

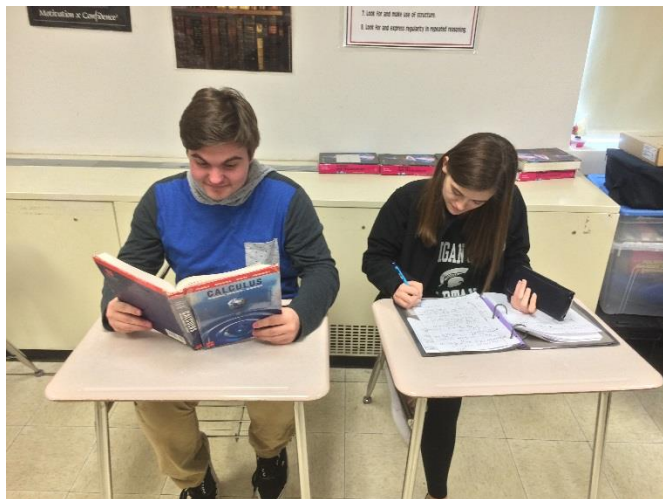
Alice: And I don't have a teaching degree so I am probably not the best candidate.

Simon: I should just look up the answers on the Internet, then I won't fail this assignment.

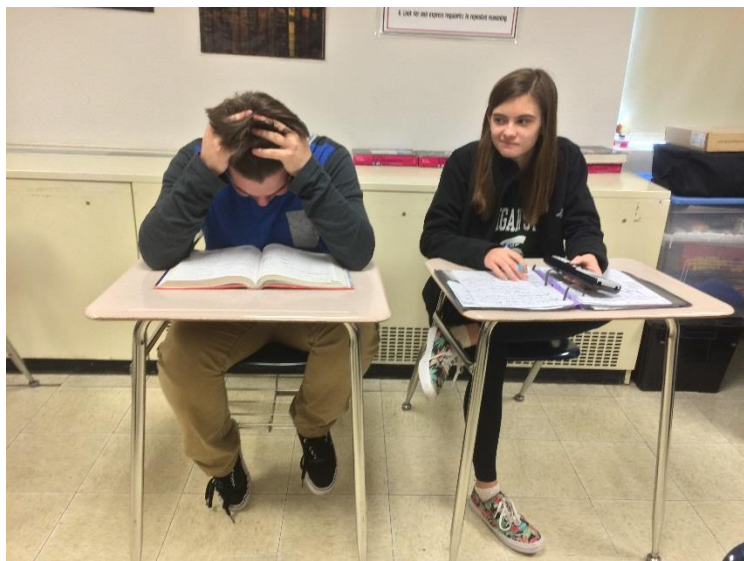
Alice: How do you expect your situation to improve if you don't figure out the process instead of looking up the answers? Taking the easy way out will never work in the long run.

Simon: We'll see.

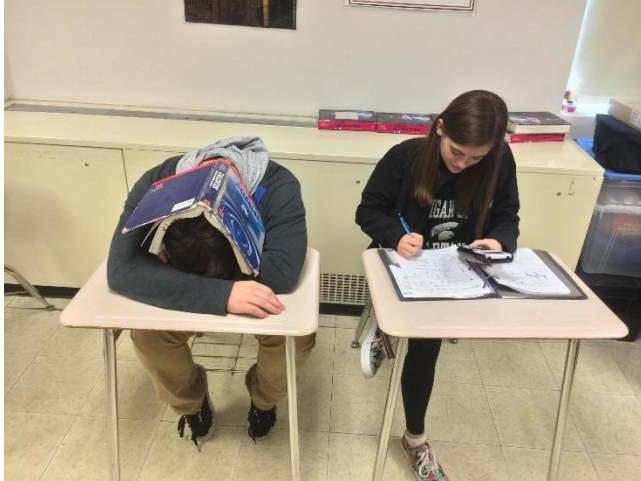
The Process of giving up:³



In this first photo, the students are beginning to work diligently at their math homework. They are studying the material and just starting to look through the problems.



This image shows one of the students struggling to understand how to solve a problem. The boy in this picture is beginning to feel stress and “freak out” about the assignment. Due to his stature you can physically see that he is distraught. The girl to his left understands the concepts and sympathizes for the boy, but she doesn’t know how to help.



The boy has placed his math textbook on his head as a symbol of defeat. He doesn't understand how to work on the assignment and his worried nature got the best of him. Because of the pressure and stress of the assignment, he has given up which will only continue to hurt his future math endeavors. Steadily working on her math homework, the girl has given up on the boy as well. She is more focused on her own grade than with helping the boy. This lack of faith is also harmful to the boy, and will accelerate his spiral of failure.

Act 1 Scene 2

(It is now after school and Simon enters his house through the front door. Simon's house is two stories, yet has a small interior. The ground floor contains a kitchen, living room, bathroom, and a stairway leading to upstairs which has two bedrooms and a shared bathroom. His mom is sitting in the kitchen waiting for him to return. She is currently unemployed.)

Mom: Hello Simon! How was your day at school?

Simon: Okay I suppose, but math was difficult today and I have to make up fifty problems.

Mom: Oh my! I'm glad I don't have math class anymore. I was never any good at it. I barely passed algebra with a C!

Simon: Well mom, I'm trying to pass with an A so I'm sure you know my pain. Anyway, I'm going to go to my room to get started on my homework.

Mom: Okay dear, but don't work too hard! You might fry your brain, especially with math homework!

(Simon walks upstairs to his room and starts to work on his math. He shuts his door so he can focus better. His desk is cluttered with papers.)

Simon: This is so hard! I still don't understand what to do even after class today. Maybe I should call Alice. No, she'll just think that I am stupid. What am I supposed to do?

Dad: *(Knocking on Simon's door)* Simon? You in there?

Simon: Yea dad, I'm working on some math homework.

Dad: *(Opening door)* Ohhhh boy, the old math huh?

Simon: Yup, but I'm not getting very far, I don't really understand it.

Dad: Well, I was never really any good at math. To tell you the truth, I hated it. But if you want I can take a look at it.

Simon: No thanks Dad, it's probably better if I figure it out for myself.

Dad: Well if you need help Son, just ask. Dinner is in half an hour, I'll see you downstairs.

Simon: Okay dad. *(Dad exits)*

Simon's Numbers⁴

The note book is blank.
 Barren, Stark, and empty
 as the clock
 Ticks and Tocks
 And Ticks and Tocks.
 Against my pursuit,
 I cannot find the numbers.

My classmates can
 Scribble, Scratch, and Scrawl
 Magnificent equations while I
 Am stuck
 Trying
 To Unlock the Box
 That has taken my numbers
 Away.
 I cannot find the numbers.

While I watch my scores drop
 Down
 And
 Down
 To an abyss of Failure,
 My mind begins to
 Wander.
 I cannot find the numbers.

Success with Numbers
 Equates to
 Success in Existence.
 So what if?
 what if?
 Now numbers force my pencil
 To scribble, scratch, and scrawl
 But the Product is
 Grotesque.
 I cannot find the numbers.

Guidance is futile,
 Assistance is trivial,
 Help is hopeless.
 If my parents cannot find
 The correct numbers for the
 M
 E
 S
 S
 In front of me,
 How Can I?

Act 2 Scene 3

(It is now Thursday. Simon and Alice are back in Mrs. Matic's geometry class and the bell hasn't signaled the start of class yet. The other students bustle around the classroom talking about their plans for the upcoming weekend. Today is the day Simon is supposed to turn in his problems for late credit. He sits at his desk furiously writing on a piece of notebook paper.)

Alice: Simon! You still haven't finished your homework?

Simon: I tried, I really did! I just couldn't figure out how to complete the problems.

Alice: Did you ask for help?

Simon: No....

Alice: What about your parents, did they try to help you?

Simon: Well my dad did offer to help me, but he said he wasn't very good at math so I told him I didn't need it. I figured it would be better if I figured it out for myself.

Alice: Why didn't you call me? I could have helped you over the phone.

Simon: I didn't want.....um.....

Alice: Come on Simon, spit it out.

Simon: I didn't want you to.... *(Bell rings)* Oh no! I still don't have my homework done and class just started! I even used an app to speed me through it!

Alice: Simon, how do you expect to get better if you take the shortcuts instead of putting in time and hard work to learn?

Simon: That's the thing Alice, I work really hard, I just don't understand it. Math is so stupid!

Mrs. Matic: Okay class, does anyone have their homework that was due yesterday that they would like to turn in today?

Student 3: I do!

Student 4: Me too, I would have had it yesterday, but I forgot it at home.

Mrs. Matic: Anyone else? No? Okay class, today we are going to learn about how areas relate to volumes.

Alice: *(Whispering to Simon)* You are in luck. I know you hate math so I did a little bit of research on why people develop a hatred for math. It might not be completely your fault for once!

Simon: *(Whispering to Alice)* Great, what did it say?

Alice: Here, I printed you out an article that I read. It will tell you what I found out.

The “I Hate Math” Epidemic

Imagine you are eating out with a group of friends. You are having a wonderful time, but the server accidentally puts all of your meals on the same bill. One of your friends pipes up that it is okay and the group can pool money together to pay for the meals, and then the bill is handed to you. Your friends ask you how much the meal cost each of them after the tip is factored in. The problem is you don't know how to take percentages without a calculator and your phone is in the car. Do you ask someone to do it instead, and play the situation off like you don't want the responsibility? Do you excuse yourself to go get your phone? Do you flat out say you don't know how?

This example shows the importance of math in everyday life and how without knowledge of it, people are put into uncomfortable and embarrassing situations. But if arithmetic is so important in day-to-day life why do so many people, both children and adults, hate it with such a burning passion?

The problem lies in two aspects of a child's learning process, the way people around them perceive math, and the way they are taught math in the critical age groups and grade levels where development is at its most volatile. Of course not all students or people care about math, or wish to put any effort towards it, but I want to focus on the ones who maintain decent grades and care about learning, not the lazy people.

Believe it or not, most children start off liking math. In her book *Math: facing an American Phobia*, Marilyn Burns says

Before they begin school, most children are fascinated with numbers and love to count. They're eager to explore shapes and they learn the names of shapes easily. They're curious about measuring and sorting and do so whenever they have the opportunity (67).

The problem starts as children get older, and their brains start to think about math less in a sense of quantity and more in a sense of a number system (Broyles & Pittard 1).

The most common grades that students begin to struggle with math are third and fourth (Williams 1). This is because of the way it is taught to them. Timed tests, such as addition, subtraction, multiplication, and division, cause students to stress about their work and worry more about turning their assignments in on time rather than worrying about learning the concepts. Because of this, stress has a negative effect on students and causes their grades and quality of learning to decline (Burns 46). Burns stated, "Children who have difficulty with skills or who work more slowly [on timed tests] run the risk both of reinforcing wrong practices and becoming fearful and negative toward their mathematics learning" (53). This is one of the key reasons why children hate math.

Doing poorly on these stressful timed tests has a negative effect as well. Failing these tests makes students feel as though they are bad at math (Burns 52). This lack of self-confidence can manifest itself as a math phobia because of the fear of failing and the feeling of inadequacy (Burns 47).

Another place classroom math becomes a problem is the focus of the teaching. Almost all early math classes focus on conceptual math, not math centered on reasoning and logic. "If we only teach conceptual approaches to math without developing skill at actually solving math problems, students feel weak. Their mathematical powers will be flimsy" (Lahey 5). Because of the way they are taught, students adopt this weak feeling that breeds hate for math faster than rabbits.

In early grades, exact answer problems such as "Sally has five crayons and she gets one more, how many crayons does Sally have now?" coupled with pencil and paper computations are used massively, as opposed to estimate problems and the use of mental math. This hurts students because it doesn't force them to think (Burns 11). Burns also commented on this problem by saying

Learning to think is what math should be about, classroom lessons and homework assignments should focus on challenging children to think, not having them merely practice procedures they learned in the class. They can do that without thinking. And it's no way for them to learn to like or appreciate math (59).

The "thinking" that is not being reinforced is problem solving and teaching students how to apply the concepts they already know to new or different issues. Without this, simple things such as cooking are exponentially more difficult. Cooking uses fractions, percentages, time, addition, subtraction, multiplication, and division (get the point?). If students aren't being taught how to apply these concepts learned in school to a real life situation, even cooking becomes hard and scary.

Parents play another vital role in their children's attitude towards math. Parents' negative attitudes towards math such as the age old phrase "I hate math" pushes children to think math is hard and that they will hate it too. This is where children follow the "Monkey-see Monkey-do" saying and can develop math hating tendencies from their parents. Some parents are even afraid to help with their children's math because it was hard for them during their schooling. Unlike learning to read, where parents will have story time with their children and they bond as well as learn, math doesn't have a warm and fuzzy hot chocolatey feeling (Burns 134-135).

Despite all of the potential negative effects parents can have on their children when it comes to math, they can have a positive one too. There are some things parents can do like use more math vocabulary, weave math into everyday activities, teach children that it is okay to struggle with work, and never EVER say phrases like "I hate math" to help their children develop a healthy relationship with numbers (Williams 2-4).

To fix the epidemic of people who hate math or who think they are bad at it we must take major steps in reforming early teaching. Drilling on the "facts" of math instead of teaching

application and problem solving is very harmful to the development of young students. It is necessary that teachers are aware of this and change their own habits in the classroom to create an environment that fosters the growth of student's mathematic abilities. But teachers are not the only ones who need reformed. Parents should be educated on how big of a role they play in their son/daughter's attitude towards all the different subjects in school and take deliberate steps to create a pathway to a love for learning.

Act 2 Scene 4

(It is Saturday afternoon. Alice and Simon are at Simon's house, and they are sitting on the couch in the living room watching TV. Simon managed to turn his homework in 2 days late.)

Simon: I read the article you gave me. So it isn't my fault that I am bad at math!

Alice: Yes and no, the way your early teachers taught you and your parent's negative attitudes towards the subject have helped create your own math issues. It is not entirely their fault though and you can't expect them to fix it for you.

Simon: So what am I supposed to do? If this semester continues on this path, I am going to end up with a C!

Alice: It's okay Simon, take a deep breath. All you have to do is get extra help. If you set aside time every day to work on your math, and you get help from Mrs. Matic I'm sure your grades will begin to flourish! You just can't be embarrassed to ask for help.

Simon: That has never worked in the past, why would it work now?

Alice: Well considering you have never spoken up in class or talked to Mrs. Matic outside of the classroom, I don't think you have actually asked the questions or received the help that you need.

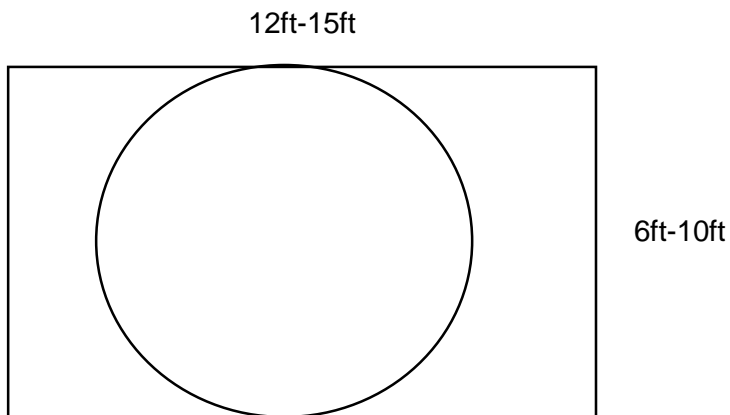
Simon: I guess you are right.....It is going to be tough, but I think I can make my grade an A this semester!

Alice: That's the right attitude! And if you need a little extra help I can help you with your homework. But remember I am no professor!

Simon: How about we do some problems on commercial breaks?

Alice: That sounds like an amazing idea! I'll go get a worksheet!

You are trying to install a circular pool in your back yard. The plot of land you can put the pool in has a length between 12ft and 15ft and a width between 6ft and 10ft. If the edge of the pool touches two of the sides of the plot, what is the largest circumference the pool can have, and what is the smallest?



Works Cited

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Lahey, Jessica. "Teaching Math to People Who Think They Hate It." The Atlantic. Atlantic Media Company, 6 Oct. 2014. Web. 20 Mar. 2016.

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Endnotes

¹ The names in this story are intentionally different from the names presented in the playbill. The characters in the playbill will show up in “Act 1 Scene 1.”

² The format I used for the dialogue within the scenes throughout this paper is modeled after the format Mr. Manoogian, my theater director, uses when writing scenes for plays. The characters of Simon and Alice are created to mirror interactions between myself and one of my fellow classmates in our math class. The names and curriculum have been changed in this project.

³ This photo essay is written to show how Simon and Alice may have interacted on any given day during their math class. The way Simon behaves in these photos is meant to help the reader understand the frustration felt towards math that many people have.

⁴ This poem is from the perspective of Simon. It is an internal monologue depicting how he feels about math.