

FLIPPED CLASSROOM

We Will Break a Glass to Break an Ice

My name is Rashidul Bari. I'm a doctoral candidate at Columbia University and your physics teacher. I teach physics because nothing is more exciting than physics. Everything you see around you--from steam engines to light bulbs to the solar panel on your rooftops are the result of physics. Remember -- there could be no technology if there was no physics. There would be no science if there was no physics. Physics is the father of all technologies and it is the father of all the sciences.

Mankind has witnessed three big leaps due to three physicists: Sir Isaac Newton, Micheal Faraday and Albert Einstein. Sir Isaac Newton's $F = ma$ paved the way for the industrial revolution, making a tiny island called Britain an economic powerhouse; Faraday's $\Phi = -N \frac{d\Phi}{dt}$ paved the way for the electric revolution transforming Britain into a superpower almost overnight and Albert Einstein's $E = mc^2$ paved the way for black holes, GPS, satellites and all the modern technologies.

And everything is the byproduct of $F = ma$. In fact, if aliens come to earth and destroy everything except our knowledge of $F = ma$, we would be able to rebuild everything -- not in centuries, but in just a few years. In fact, by this time next year, you will be able to trace everything back to that single formula -- $F = ma$ -- and I will do everything humanly possible to help you understand the significance of this single equation over the next 180 days, during which I will create 180 Physics websites.

Each of my websites will consist of five components: (1) Flipped Classroom, (2) Do Now, (3) Big Idea, (4) Escape Room and (5) Homework. This is how we'll learn starting from day 1 to the very last day.

Flipped classroom will give you an idea of what we'll do in class ahead of time. For example, tomorrow we will have an icebreaking session. For the Do Now, students will pair up with someone sitting next to them. They will share stories with each other for 10 minutes and I will randomly choose students to share their partner's story. Then we will move on to the Big Idea. Students will watch a video for two minutes. Then I will tell them to solve the problem in the video individually for five minutes and as a group for five minutes. Then I will randomly choose students to share their experience: whether it was more helpful to solve the problem individually or in a group. Then students will do the exit slip by trying to escape from the escape room. There will be three questions and students will try to answer them in their notebooks. This is a competition. Whoever raises their hand first will be invited to use the smartboard to open one of the doors by entering the key. Every day, students from the class will have the opportunity to open the door and escape the lab. The 3 students who correctly open the 3 doors will be announced the winners of Day 1. Everyone else will stand up and congratulate them.

The homework will give students a chance to reflect on what they have learned. It also allows them to see whether they can solve similar problems by applying prior knowledge (learning related to Day 1).