

PHYSICS WEBSITE 1

Topic : Icebreaker to Glass Breaking

Link | <https://barisciencelab.tech/Physics1.html>

FLIPPED CLASSROOM

We Will Break a Glass to Break an Ice

Video | <https://youtu.be/u1FMYPu6p4s>

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 $\epsilon = -n \frac{\Delta\Phi_B}{t}$ paved the way for the electric revolution transforming Britain into a superpower almost overnight and Albert Einstein's $R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$ 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).

DO NOW (10 mins)

We Will Break a Glass to Break an Ice

Video | <https://youtu.be/M0c9gCbveL4>

Students work in partners near where they are already sitting. Give them 7-10 minutes. Each student will tell a story/memory to the other in order to get to know them better. I will remind you time to time to switch so each partner has a chance to tell the story. After 10 mins, I will randomly call on a partner to share the other partner's story. For example, if Jack and Steve are partners, Jack tells Steve's story and Steve tells Jack's story. These can be short and sweet and a good way to get to know someone in the class.

Some prompting topics if needed:

- Tell us about your family
- Tell us your favorite movie/book or show
- Tell us the silliest thing you ever did
- Tell us what made you choose Brooklyn Tech
- Tell us something you fear the most
- Tell us the last time you laughed so hard you cried
- Tell us who your closest relative is
- Tell us a hobby you love to do

BIG IDEA (20 mins)

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Video | <https://youtu.be/IbpSN5wERuM>

Students will watch a 2 mins long video. First, they will use 5 minutes to solve the problem individually. Then, they will use 5 mins to solve it with the do now partner. They will write the answer as well as explaining whether it was easy to solve it individually or as a group.

EXIT SLIP (10 mins)

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Video | <https://youtu.be/MDrqnrQ7bMo>

Students will Enter the Escape room to solve three exit slip questions as a group. They will raise their hand as soon as they solved it in their notebook. I will call them to the smartboard to enter the key to escape from the room. If their keys work then they would be the winner. If their key does not work, then the group raise hand second, would be invited to give a try.

Homework:

We Will Break a Glass to Break an Ice

In a paragraph or two, students will:

1. explain if working individually or in groups helped them more to solve the problem
2. attempt to explain why they think the rock dropped from the highest height broke the glass, but not the rock dropped from the two lower heights.