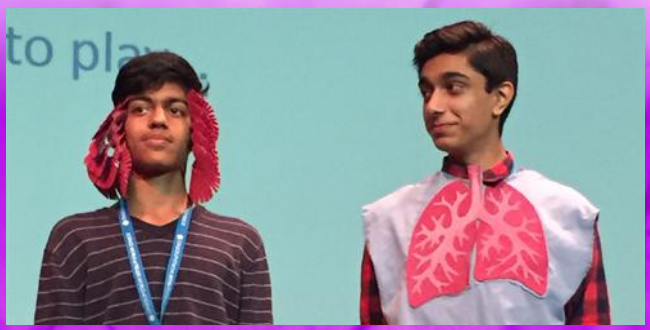
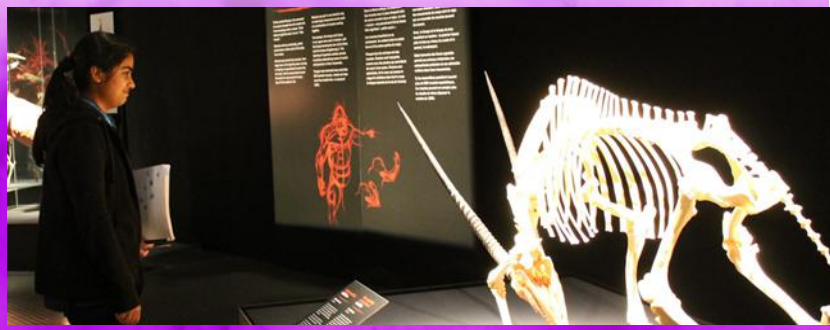
Biology

The Biology session began with a general introduction to cell biology and genetics. The students explored how the cell uses DNA sequences to make proteins, and acted out the processes of transcription and translation with marshmellows and twizzlers. They also extracted DNA from strawberries, and learned about the steps used in the laboratory to prepare samples for DNA analysis. Next, we saw natural selection in action. For homework, the students created organisms with different traits, and then got the chance to roll and battle their way to success in the evolution game. They learned how an animal's traits can be either beneficial or detrimental, depending on the environment, and how certain skills can give you advantages when competing with other organisms. These traits are rooted in the organism's genetics, and the inheritance of such traits was explored in the Beaker Babies activity; using famous characters as examples, the students followed how parents' genes are shuffled and distributed among their offspring. This is a key aspect of evolution! In addition to affecting traits like eye color and height, mutations in the DNA can also cause disease. After learning about the cutting-edge technologies used to sequence genomes, the students learned to use raw data files to determine a genetic sequence, compare it to a healthy reference sequence, and locate a mutation that causes sickle cell anemia. Even when you're healthy, learning about your genetics can also have real health consequences, and it can sometimes put people in a situation where they have to make tough choices that will affect not only themselves, but family members that probably share those genetics. The Marfan syndrome activity allowed the students to explore some of the choices people need to make when faced with a genetic disease, and how it affects their lives.





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Some mutations in DNA give the cell dangerous traits, like dividing too much or becoming 'invisible' to the immune system, which we believe can promote cancer development. My lab studies mutations that make the DNA more likely to gain even more changes, a run-away effect called genetic instability.