



**HEADSHOT** wins

## **ENTREPRENEUR AWARD**

Have you ever had an idea that could change the world? Three high school students from Midvale are on their way to do just that. Madison Hooper, Shreya Mahasenan and Marie Miskin are athletes at Hillcrest High School. They are also the winners of the first-ever STEM Entrepreneur Award and among the finalists in the Lassonde Entrepreneur Institute's 2017 High School Entrepreneurship Challenge.

Their award-winning idea, HeadShot, is a new way to solve the ever-increasing problems of concussion diagnosis right at the onset of injury. For



them, this idea hits a bit close to home: these young women athletes have either been on the receiving end of a head injury or have watched it happen to a teammate.

"I received a head injury a while ago and went to multiple appointments, receiving multiple x-rays, only to be told that I just needed to rest and could play sports again when I felt normal," Shreya said. "But feeling normal does not mean that you have fully healed. And within days of being back to normal activity, I relapsed. Our goal is to take the guesswork out of the diagnosis, so that people with concussions can truly know when they can resume their regular routines."

It was this experience that inspired Shreya to create HeadShot. HeadShot uses Emotional Engagement Measurement (EEM) tests to diagnose concussions, determine when the brain is fully healed and when the patient can return to normal activity. EEM tests



*Madison Hooper, Shreya Mahasenan and Marie Miskin*

Learn more about STEM Action Center programs at [stem.utah.gov](http://stem.utah.gov)



***“What’s best about this device is that it’s small and portable enough that you can have it on the sidelines of any sporting event, ready to be used at any time.”***

target specific lobes of the brain (frontal, parietal, occipital and temporal) and use different questions or stimulations to generate a response from them.

The HeadShot device is a small, handheld monitor connected to sponge diodes that are placed directly on the athlete’s head to measure brainwave activity. If the results show little or no response, or show hyperactivity, the person doing the test knows a concussion has occurred and can treat accordingly.



Tests can also be performed as the person is recovering to monitor the recovery process so doctors can know when it is okay for the person to return to normal activity. Results from the test will either be compared to the athletes normal brain functions, which are recorded at the beginning of the year or with a test group that have had no previous head injuries.

“What’s best about this device is that it’s small and portable enough that you can have it on the sidelines of any sporting event, ready to be used at any time,” Shreya said. “You can diagnose right as the injury takes place and eliminate the guess work that goes into the first few hours of concussion diagnosis. We hope one day in the future that this product will be used on sidelines, in doctor’s offices, and in sports medicine offices around the country. In the meantime, we will continue to develop the software needed to run the program, and continue to work with teachers at Hillcrest and neurologists at the University of Utah to make our product a reality.”

Learn more about STEM Action Center programs at [stem.utah.gov](http://stem.utah.gov)

