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## **Ayana Patel wins 2021 Arkansas Soybean Science Challenge Junior Division Award at the Southwest Arkansas Regional Science Fair**

Ayana Patel, age 11, a 6<sup>th</sup> grader at Magnolia Middle School in Magnolia, won the Soybean Science Challenge Junior Division award at the 2021 Southwest Arkansas Regional Science Fair held at Southern Arkansas University on March 12.

Patel received a \$200 cash award provided by the Arkansas Soybean Promotion Board. Her science project titled “Got Oxygen?”, also received third place in plant sciences.

Ryland Ochs, Patel’s teacher, won the \$100 Soybean Science Challenge Junior Division Teacher-Mentor Award. Ochs stated that the Soybean Science Challenge is a great way to be introduced to agricultural research. “When Ayana’s project was submitted into the local and regional science fair the judges recommended her project be submitted into the Soybean Science Challenge. It turned out to be a great experience for both of us,” he replied.

Patel was thrilled to win the 2021 Junior Division Soybean Science Challenge. “I was very excited to see I had been chosen to receive the SSC Award,” she stated.

Hetal Patel, Ayana’s mother, was very happy to see her receive the award. “I was very excited and proud to see what she had accomplished,” she responded.

Ayana explained that she learned a lot from the Soybean Science Challenge online course. “The most useful and interesting thing I learned about soybeans is that they are one of the most sustainable crops in terms of nutritional value and impact on the land. Not only do they have the highest protein level, soybeans also produce more oil than any other crop. By fixating nitrogen from the atmosphere, soybeans enhance the soil without adding more nitrogen,” she explained.

Ochs related that Ayana learned a lot from participating in The Challenge this year. “My student gained experience in presenting research. If she decides she wants to go into research as a profession, she can always look back on this experience. Not to mention, she was very happy to have an accomplishment this year,” he replied.

“The Soybean Science Challenge provides an opportunity for Arkansas Junior High and High School students to participate in scientific research that can impact the State of Arkansas as well as the world. Soybean Science Challenge student researchers learn about this important commodity crop and its many uses including feeding the world, development of biofuels and

sustainable products. The Soybean Science Challenge helps students develop an understanding of the challenges and complexities of modern farming,” said Dr. Julie Robinson, Associate Professor and director of the program.

“The goal of the Arkansas Soybean Science Challenge is to engage students in “real-world” education to support soybean production and agricultural sustainability,” said Gary Sitzer, a former member of the Arkansas Soybean Promotion Board. “The program also rewards scientific inquiry and discovery that supports the Arkansas Soybean Industry.”

The Arkansas Soybean Science Challenge was launched in January 2014 to 9-12<sup>th</sup> grade science students. In 2021, the Junior Division award was added for grades 6-8. Students who successfully completed the online course were eligible to have their original soybean-related research projects judged at the 2021 ISEF-affiliated Arkansas Science and Engineering Fairs.

Information on the 2021-2022 Arkansas Soybean Science Challenge will be available in summer 2021. For more information, contact Dr. Julie Robinson at [jrobinson@uada.edu](mailto:jrobinson@uada.edu) or Diedre Young at [dyoung@uada.edu](mailto:dyoung@uada.edu).

The Cooperative Extension Service is part of the University of Arkansas System Division of Agriculture.

**Ayana Patel, Magnolia Middle School, Magnolia, Arkansas; Teacher, Ryland Ochs**

**Category: Plant Sciences**

**Title: Got Oxygen?**

**Abstract:**

My science fair experiment was, “Which Leaf Releases the Most CO<sub>2</sub> in Two Hours?” I did this project because I thought it would be very interesting to actually see the oxygen when it is released. This project helped me learn more about photosynthesis, and how plants release oxygen. I tested my scientific question by putting leaves in water for two hours, and then counted how many bubbles were on each leaf. The number of bubbles on the top of each leaf would tell me how much oxygen it released, so the leaf that had the most bubbles released the most oxygen.

The materials for my experiment were a camera, leaves, glass bowls, water, sunlight, rocks, and magnifying glass. My hypothesis for this experiment was that, if the Fringe flower is outside, in a bowl of water for two hours, then it will be the leaf to produce the most oxygen. I thought this, because according to research, the leaves with the smoothest and lightest texture, release the most oxygen since it can freely move through it.

The first procedure for this experiment, was to go outside and get four different types of leaves (that are a similar size) and get four rocks of the same size. Then, I got four glass bowls that were of a similar size and put a different leaf in each bowl. Next, I placed a rock on every leaf in the bowl and took all of the bowls outside into the sunlight. You should be able to go inside and keep them in the sunlight for two hours. Lastly, you have to go through on every leaf

and count how many bubbles are on it (using a magnifying glass). Then record your data and take pictures.

The independent variable in this experiment is the type of leaf placed in the bowl of water; the dependent variable is the number of bubbles on each leaf. Lastly, the constant in this experiment is the time that you leave the leaves in the bowl of water. An observation that I noticed was that right when you put the leaf in the water, it starts to form bubbles. My results were that the Chinese Holly released 7 bubbles, the Multiflora Rose released 18, the Alpen Rose released 22 bubbles, and the Fringe Flower released 34 bubbles.

My results show that the Fringe Flower released the most oxygen. My hypothesis was proven to be correct. If I were to repeat this experiment, I would only use soft textured leaves, since they are the leaves that release the most oxygen. There was a big difference in the number of bubbles in some of the leaves. In conclusion, I now know that every leaf releases a lot of oxygen, and if this was in only two hours, then they probably release a lot in a day!