

## Background and Objective

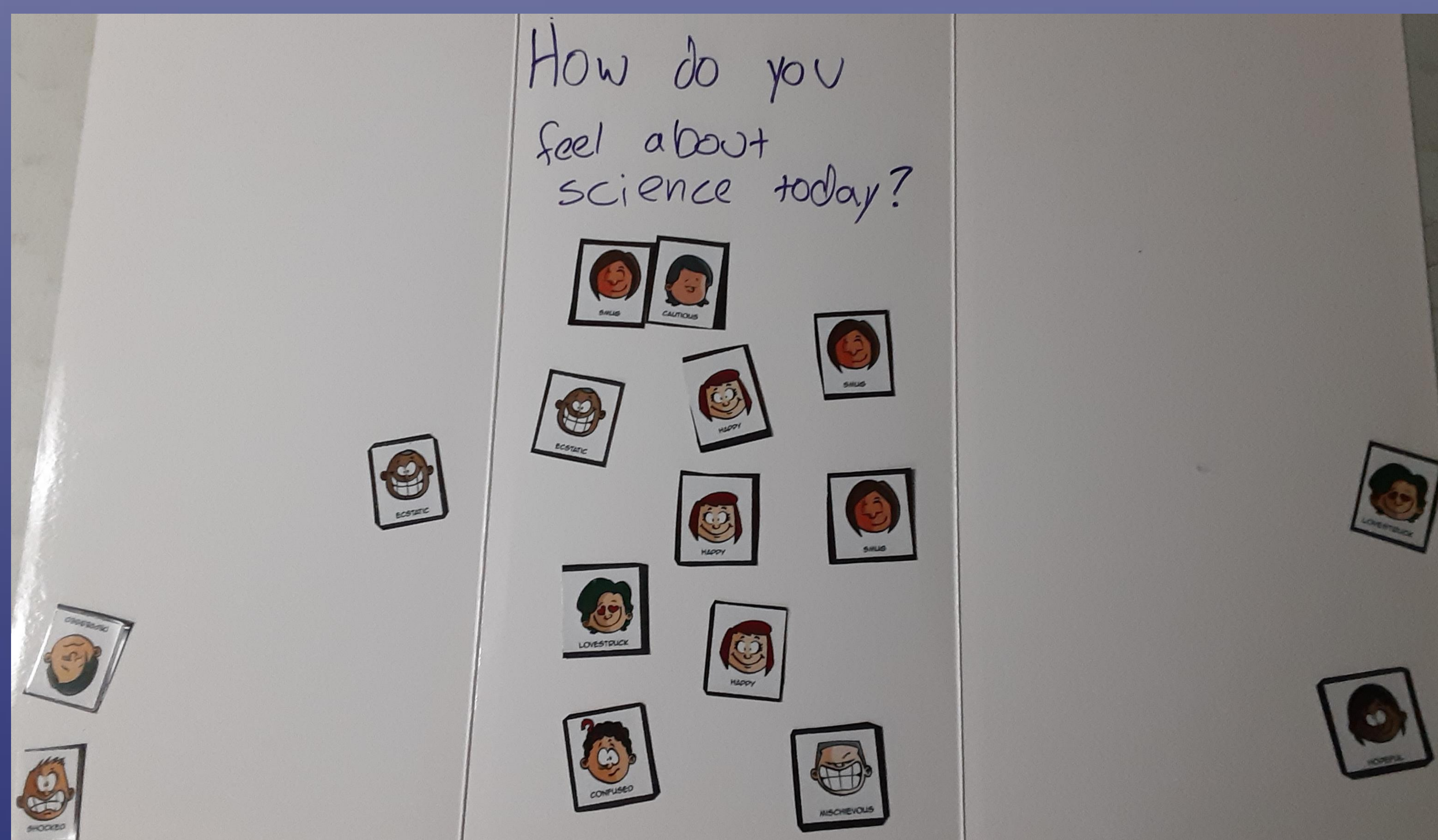
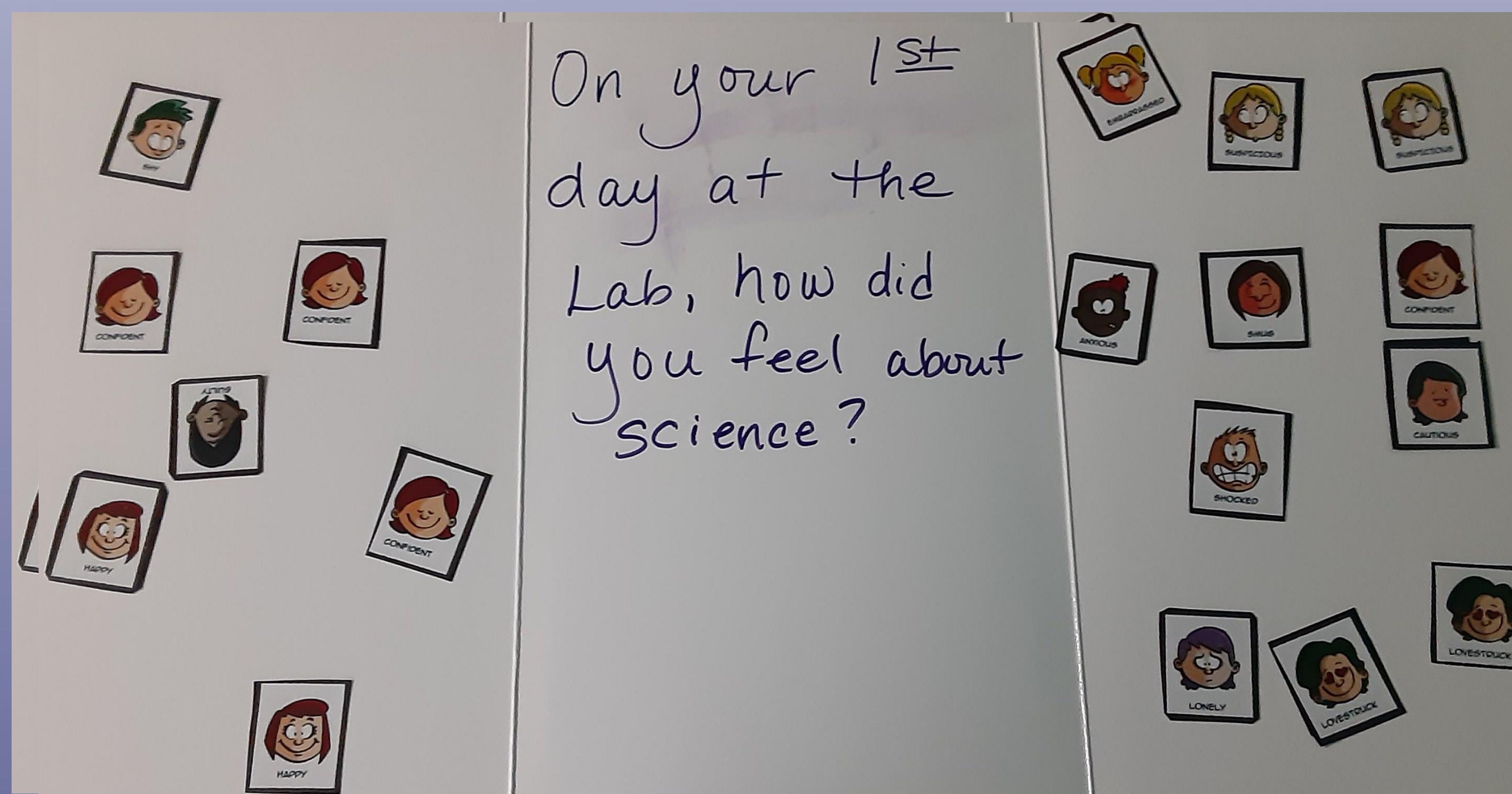
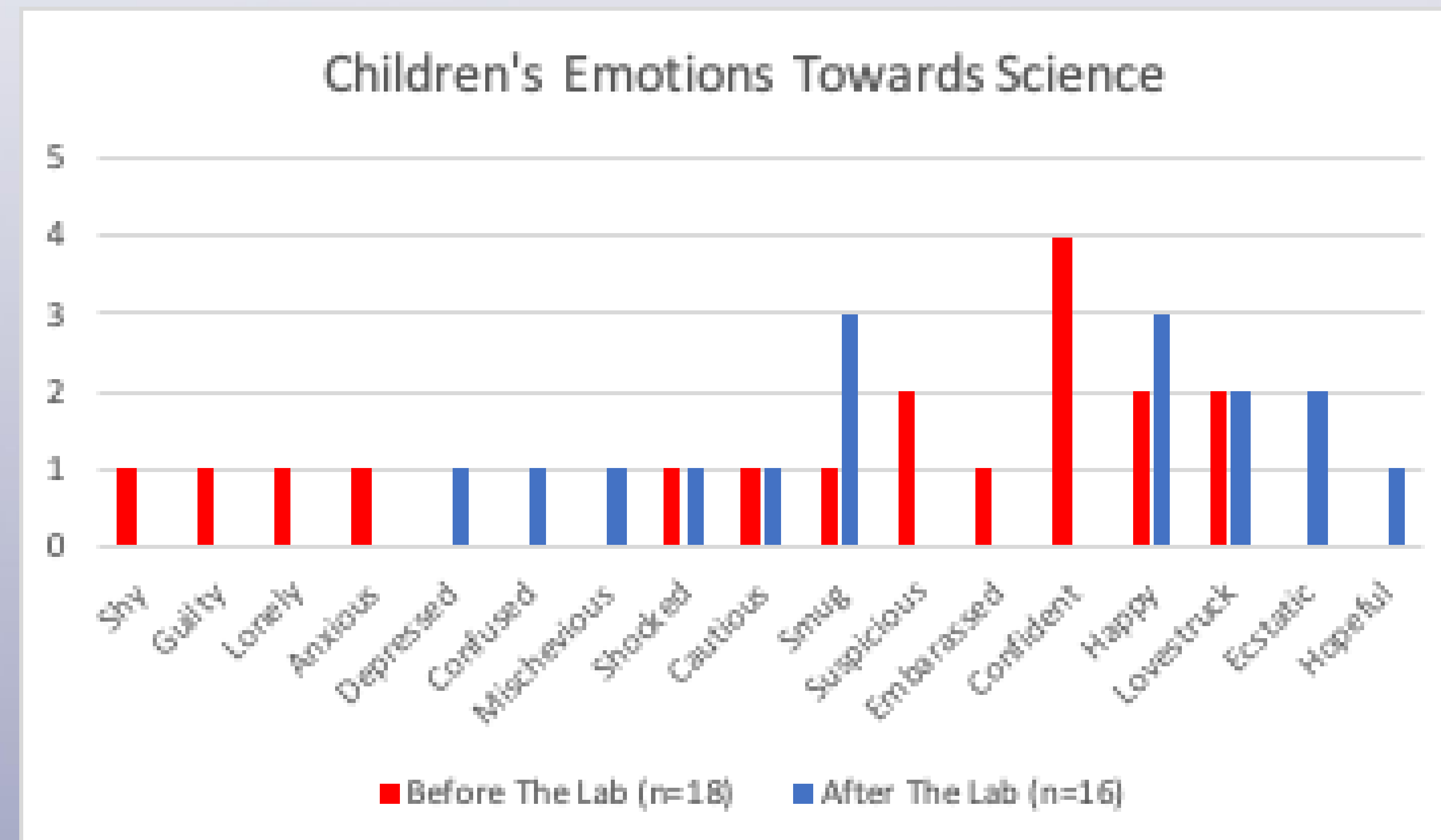
- Assembly of Faith Outreach Center (AFOFC) is a church on the far South Side of Chicago in the Morgan Park area.
- The church serves low-income, predominantly African American families including Morgan Park, Roseland, Rosemoor, and Pullman.
- AFOFC hosts an after-school program for 20-30 children in grades pre-K to 8, many of whom expressed a lack of science knowledge.
- Only 1 out of 3 of the students' schools has a physical science lab
- Studies have shown that students respond to science when hands on experiments are conducted.<sup>1</sup>
- The Science and Engineering Indicators 2018 data shows a disparity in minorities in the science community. Especially in the case of African American individuals, who make up 12% of the United States population age 21 years plus, but only hold 5% of science and engineering jobs.<sup>2</sup>
- The purpose of this project was to determine if providing students with the opportunity to experiment with science ands-on would improve their feelings towards science in an under-served pediatric population.

## Description

- This project was IRB exempt.
- This was a quality improvement project where students participated in 10 weekly, 1-to-2-hour, hands-on science projects, coined "The Lab" to promote science learning.
- An introduction to "The Lab" was conducted to establish safety rules
- The science projects had a focus on health and pharmacy.
- Projects included compounding bath bombs and soap, modeling the heart, extracting DNA from strawberries, and origami DNA modeling.
- A staff of 4 colleagues; 2 pharmacy students/interns, a pharmacist/clinical instructor, and a pharmacy technician with a Masters of Education facilitate and guided the children through the experiments.

## Evaluation Method

- The method utilized to determine if there was a change in emotions towards science was a Feelings Faces Magnet Board. A child-friendly adaptation of Jim Borgman's Feeling Faces were printed as magnets.
- Students were called in pairs and asked to choose one face that represented their feelings about science before and after participating in "The Lab." Children were also given the option to write in an emotion if the magnets did not align with their perceptions.
- Due to the variety of ages and academic interests, a feelings board was most effective to gauge the student's change in emotions via pictorial methods.



## Outcomes

- A total of 18 responses were collected in the pre-survey and 16 responses in the post-survey.
- More students after "The Lab" responded with smug, happy, ecstatic, and hopeful than before "The Lab." This result is indicative that the students were becoming more excited about learning science.
- Zero students after "The Lab" expressed being shy, guilty, lonely, anxious, or embarrassed. Therefore, these students' emotions improved over the course of the series.

## Conclusion

- Based on the lack of shy, guilty, lonely, anxious, and embarrassed responses, along with the expression of hopeful, ecstatic, happy, and smug, "The Lab" series was successful in promoting science and improving the children's emotions towards learning science.
- The long-term goal of this project was to establish a base for the children to continue science learning and follow fulfilling careers in areas that African Americans are often underrepresented. Unfortunately, it is not yet possible to measure this outcome, but the children's enthusiasm was encouraging.

## Next Steps

- The COVID-19 pandemic brought the program to an early halt.
- The original intent was for the children to create their own science projects, and accompanying trifold posters, which would be presented to the community in a classic science fair format.
- The survey was planned to be conducted after the science fair.
- Instead, an online curriculum was conducted, which had low turnout. This could be due to many socioeconomic reasons including lack of technology
- Moving forward, we wish to continue to serve the children at AFOFC and conduct the promised science fair.

## Acknowledgements

- Pastor Sharon J. Gross, Assembly of Faith Outreach Center, Chicago, IL
- Dr. Clara Okorie-Awe, Associate Dean for Diversity and Inclusion and Director for Urban Health

## References

1. Agranovich S, Assaraf OB-Z. What Makes Children Like Learning Science? An Examination of the Attitudes of Primary School Students towards Science Lessons. Journal of Education and Learning. 2013;2(1). doi:10.5539/jel.v2n1p55.
2. National Science Foundation. Science and Engineering Indicators 2018. Published Jan. 2018. Accessed June 2, 2020. <https://www.nsf.gov/statistics/2018/nsb20181/report>