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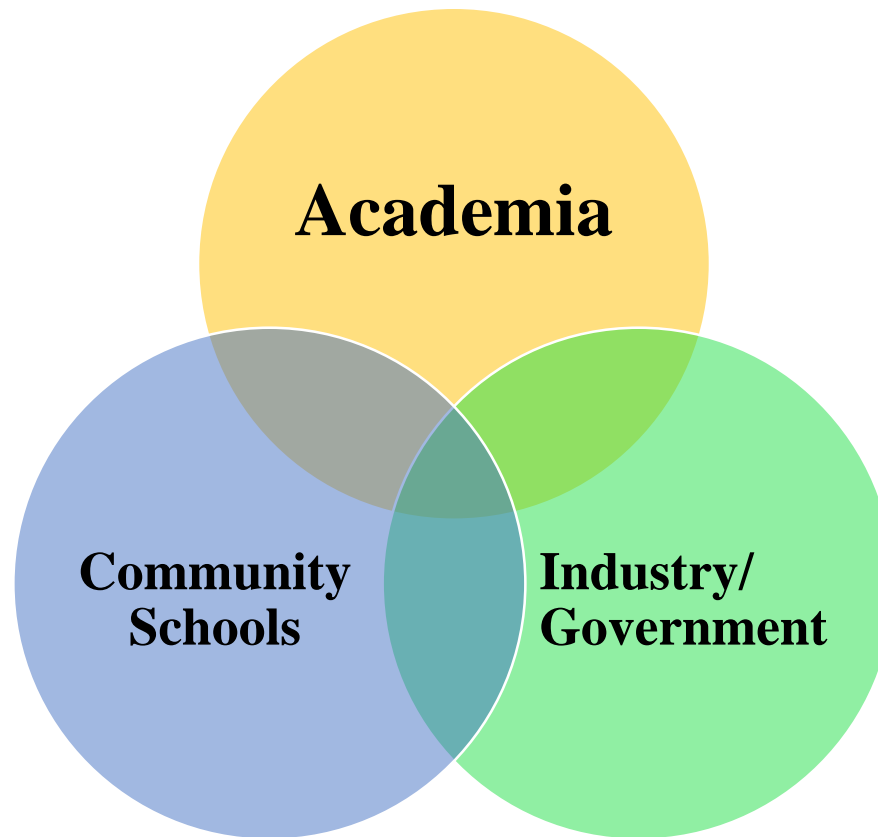
Evolution of Nanomachines In Geospheres and Microbial Ancestors



Engaging Urban K-12 Children in Complex Science Topics

Christine Bean, Janice McDonnell, Dr. Kenneth McGuinness, **R. Alesha Vega**

Partnership Model for Working with Urban Youth & their Families

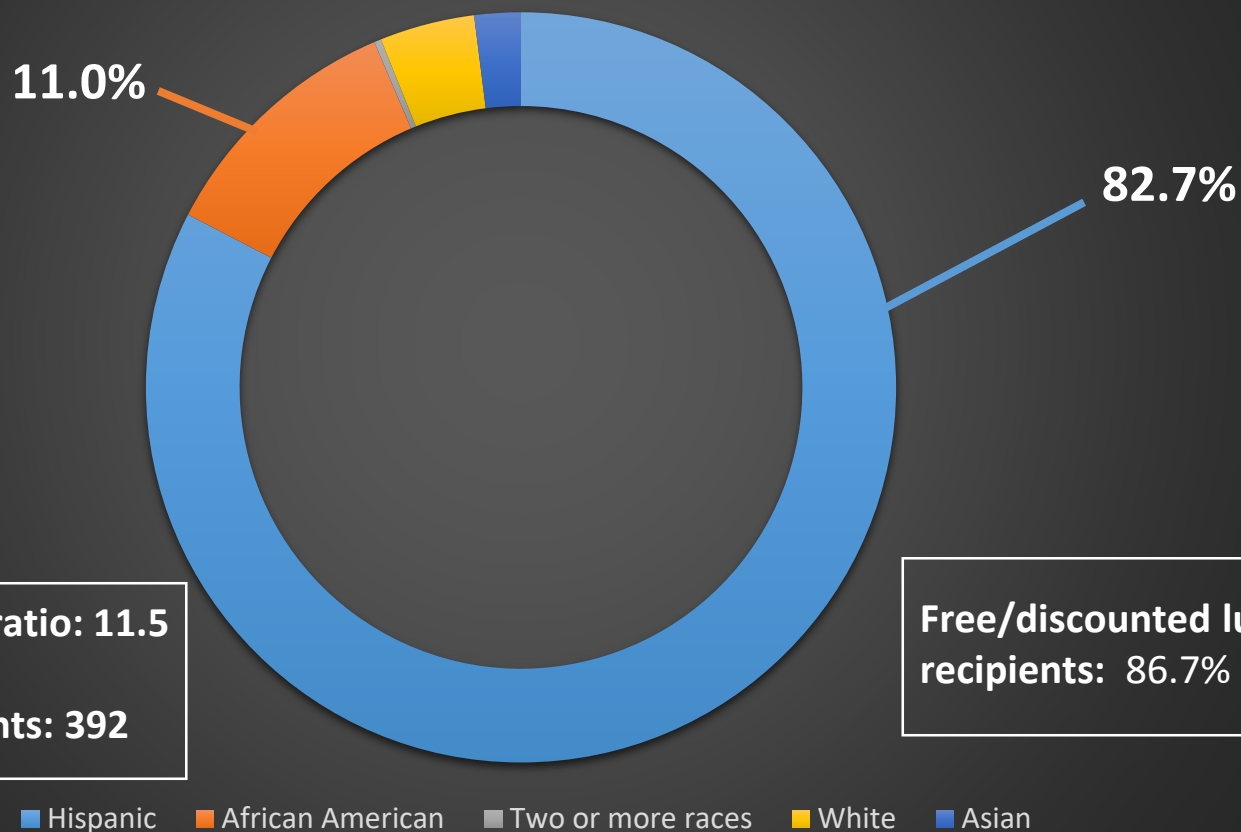




Cooperative Extension/Rutgers University's School of Environmental and Biological Sciences (SEBS)/4-H STEM



Greater Brunswick Charter School K-8 Student Demographics breakdown:



Data source: National Center for Education Statistics, U.S. Dept of Education 2017

McKinley Community School K-8 Student Demographics breakdown:

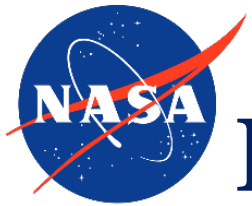
Student/teacher ratio: 9.7
Number of students: 729

25.5%

Free/discounted lunch
recipients: 63.1%

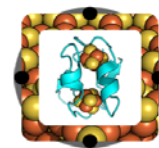
73.4%

■ Hispanic ■ African American ■ Two or more races ■ White ■ Asian ■ American Indian



NASA Astrobiology Institute ENIGMA Team, Rutgers University

- Rutgers Scientists led project aligned with the astrobiology context of NASA missions
- Broader Impact component of ENIGMA
- Coalition of Rutgers Scientists, Student Volunteers, Professors and Staff



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Evolution of Nanomachines In Geospheres and Microbial Ancestors



Industry Partners Opportunities and Challenges

- An Unexpected partnership
- Participating with Industry Scientists
- Differences in outcomes
- Press & Visibility
- Timing
- Alignment of mission

Developing After-school Programs for Students and Families

- Planning Committee with Rutgers Scientists & Department of Youth Development Staff
- Meetings with NB public school system's Dean, Principals, Family Liaisons, teacher program leaders, and NB science supervisor
- Working with the local High School - student volunteers (many who were bi-lingual)

Astrobiology Passport
Today you are an Astrobiologist!

Logos: NASA, AT&T, RUTGERS

Station 1
Rocks and Minerals - What kinds of environments are necessary for life? Learn how rocks and minerals contain clues about signs of life on Earth and other planets. Test your classification skills and compare the surfaces of Earth and Mars!

Station 2
Telescopes and Astronomy - Is there life on other planets? Learn how astronomers use light to study stars and planets! Use tools that focus on how we see the universe!

Station 3
Paper Microscope - How do we study life? A microscope is a tool used to see objects that are too small to be seen by the naked eye. Put together a microscope and take it home with you!

Station 4
Meet the Planets! - Did you ever want to take a tour of our solar system? What are the planets that orbit our sun? The Sun's energy helps to fuel life on Earth and perhaps other planets. Compare the size of the Sun and planets by building a scale model using every day simple materials!

Station 5
What is life? - We think of proteins as the building blocks of life. Explore protein models and learn about two proteins that help human beings survive.

Estación 1
Rocas y Minerales - Qué clase de ambientes son necesarios para la vida? Aprende cómo las rocas y los minerales contienen las claves de las señales para la vida en la Tierra y otros planetas. Prueba tus habilidades para clasificar y comparar las superficies de la Tierra y Marte!

Estación 2
Telescopios y Astronomía - Hay vida en otros planetas? Aprende cómo los astrónomos usan la luz para estudiar las estrellas y los planetas! Usa herramientas que se enfocan en cómo vemos el universo.

Estación 3
Microscopio de papel - Cómo estudiamos la vida? Un microscopio es una herramienta que se usa para ver objetos que son demasiado pequeños para ser vista a simple vista. Arma un microscopio y llévatelo a casa.

Estación 4
¡Conoce los planetas! - ¿Alguna vez has querido darte una vuelta por el sistema solar? ¿Cuáles son los planetas que orbital el sol? La energía del sol ayuda a sostener la vida en la Tierra y quizás en otros planetas. Compara el tamaño del sol y los planetas construyendo un modelo a escala usando materiales de uso diario.

Estación 5
¿Qué es la vida? - Se cree que la proteínas son parte esencial de la vida. Explora varios modelos de las proteínas y aprende acerca de dos proteínas que ayudan a los seres humanos a sobrevivir.

Developing After-school Programs for Students and Families



What is life? Exploring proteins as the building blocks of life.



***How do we study life?
Building paper
microscopes.***



Learning how rocks and minerals contain clues about signs of life on Earth and other planets.



Meet the Planets! Comparing the size of the Sun and planets by building a scale model.



Learning how light can be used to detect life on other planets.

Developing After-school Programs for Students and Families cont..

WATCH TOPICS ▾ ABOUT ▾ CONTACT SEARCH 🔍

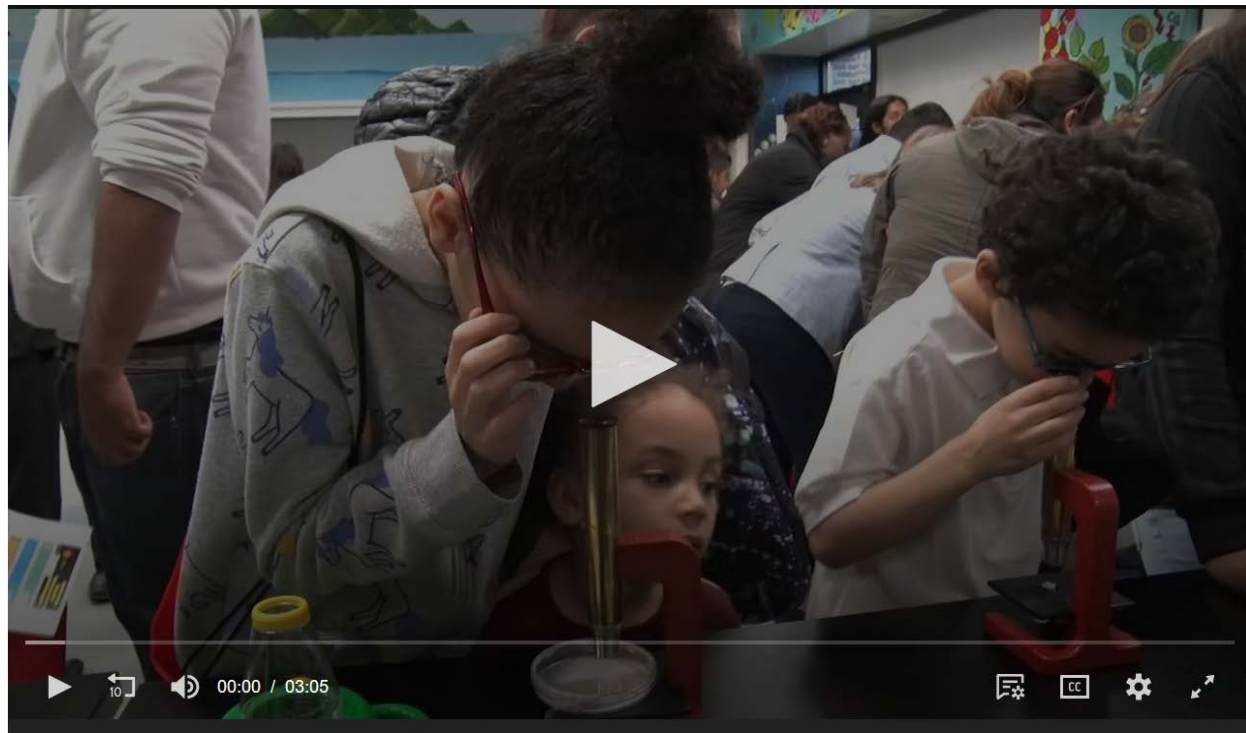


SCIENCE & TECHNOLOGY

Students learn about researching life on other planets

BY [Briana Vannozi](#), Correspondent | May 14, 2019, 4PM EST

Press work with Rutgers
and outside Media
(NJTV, NJ News 12)



Exit surveys to help develop strategies for increasing involvement

Q1 - What did you think of this event?

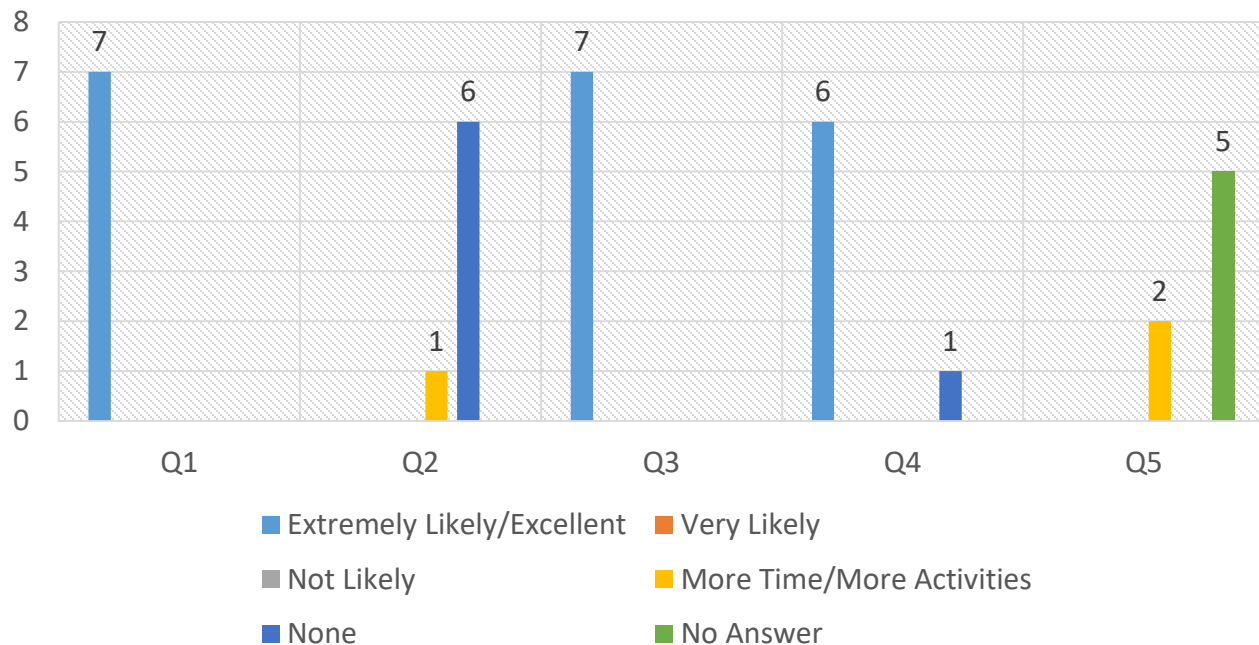
Q2 - What did you like least about the event?

Q3 - How likely are you to come to another Family Science Night?

Q4 - How likely would you be to recommend this event to others?

Q5 - What can we do to make the Family Science Night better for your family?

**Family Science Night Parent Survey
Results – McKinley Community School
n=7**



Translating complex concepts of Astrobiology research into relatable educational products for teens



Impacts of Parental Involvement for Children's Academic Success

- Engaging Students, Faculty, and Communities in New and Different Ways
- Innovative Collaborations with Minority Serving Institutions
- Challenging Societal Issues and Facing Human Crises



1. Van Voorhis, F. L. Interactive homework in middle school: Effects on family involvement and science achievement. *J. Educ. Res.* **96**, 323–338 (2003).
2. Eccles, J. S. & Harold, R. D. Parent-school involvement during the early adolescent years. *Teach. Coll. Rec.* **94**, 568–587 (1993).
3. Yoder, J. R. & Lopez, A. Parent's Perceptions of Involvement in Children's Education: Findings from a Qualitative Study of Public Housing Residents. *Child Adolesc. Soc. Work J.* **30**, 415–433 (2013).

Challenges & Opportunities

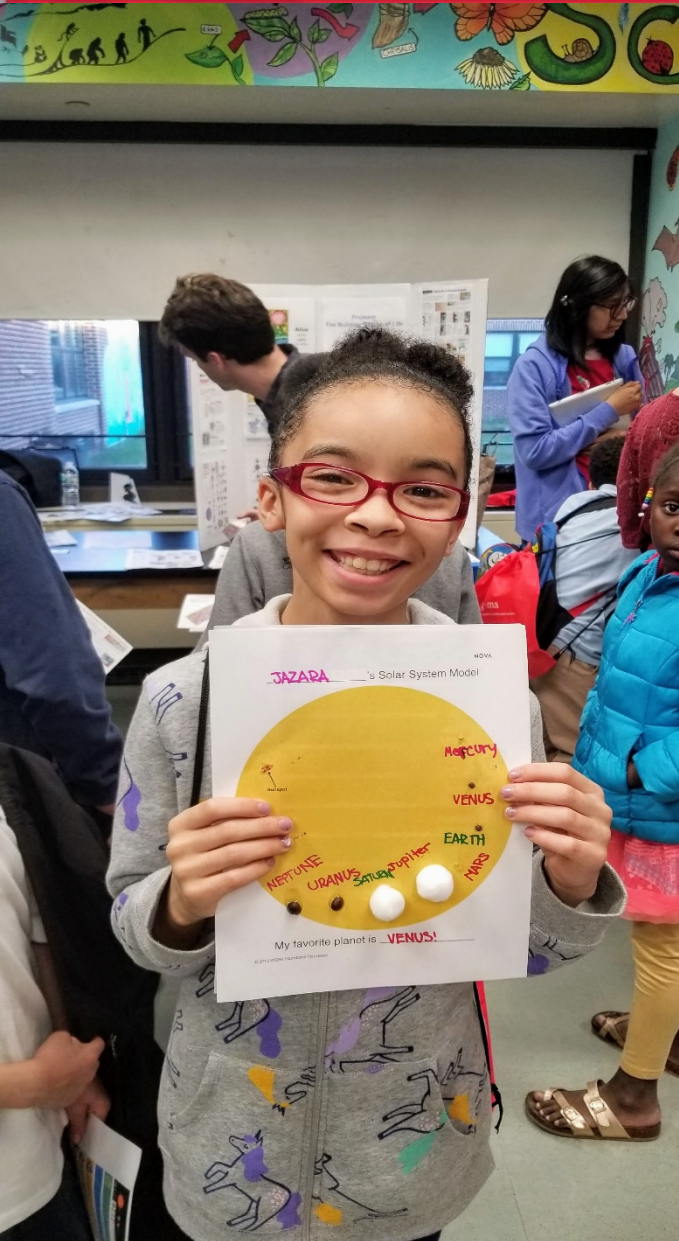
- Communication lines
- Funding/Resources
- Sustain current after-school programs
(Buy-in from participating schools)
- Future Opportunities for Engagement



Where do we go from here?

- Astrobiology After School programs for grades 4th-8th
- Program Sustainability and Involvement
- Follow Up Case Study

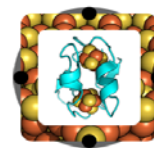




Thank you for attending!

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