

Using Physics Lab Tours For Pre-College Students To Promote Scientific Identity

Robert D. Niederriter & Kathleen Hinko, *University of Colorado - Boulder*

Partnerships for Informal Science Education in the Community (PISEC) [1]

Confronting the challenge of racial, ethnic, and gender diversity among physicists by facilitating pre-college students' participation in physics.

Components:

- Afterschool program with group inquiry activities
- Field trip to CU/lab tours

University Educators (UEs)

- Graduate & undergraduate student volunteers
- Facilitators & mentors



Group picture



Making liquid nitrogen ice cream

Goals of PISEC Field Trips

We have intentionally designed the field trip experience to promote growth of students' science identity, but also to provide opportunities for students to situate their science identity in a physics researcher context.

1. Provide resources to encourage students to envision themselves as **scientists** by demonstrating what it means to be a **scientist** and making the activity of scientists doing **science concrete**.
2. Provide resources to encourage students to envision themselves as **college students**.
3. Emphasize to students that they are **scientists** and that they have been doing **real science** in the PISEC program.
4. Show students that science is **fun** and **exciting**.
5. Expose students to the **culture of scientists** (and expose scientists to the culture of the students).

Field trips and lab tours cultivate physics identity



"Wow!"



Freezing and smashing flowers

Components of identification with Physics

Two descriptions of how students come to identify with physics actually coincide. We use both of these to inform the design of field trips and lab tours.

Hazari's dimensions of physics identity [2]

- Interest
- Competence
- Performance
- Recognition

NRC's strands of informal science [3]

- Interest
- Knowing about, using, and contributing to science

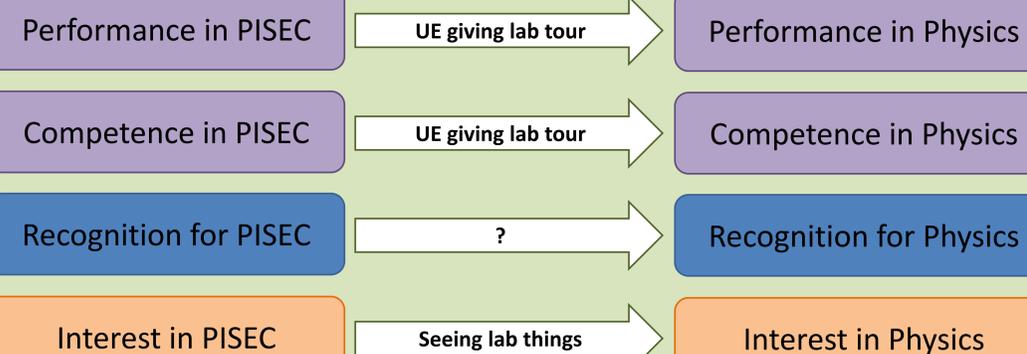
Goals of PISEC Lab Tours

In our design of lab tours we seek to demonstrate to students what it might mean to perform and show competence as a physicist in a lab. Specifically, we want students to:

1. **See a scientist in a lab;**
2. **Touch and interact with objects in the lab;**
3. **Hear about current physics research.**

Mapping PISEC identity to Physics identity

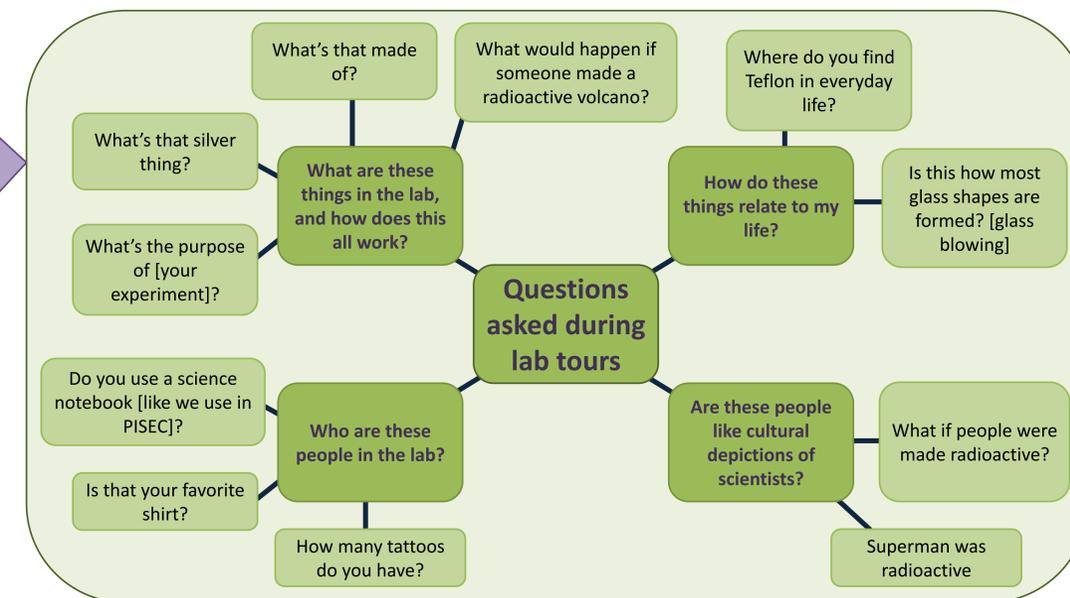
Students readily identify with the PISEC program. We want them to also identify with physics more generally. Three of the dimensions of identity can be mapped directly from PISEC to Physics during field trips and lab tours.



Lab tours



"That's so cool!"



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References

1. PISEC: <http://www.colorado.edu/physics/PISEC>
2. Z. Hazari et al., *J. Res. Sci. Teach.* 47, 978 (2010).
3. National Research Council, *Learning Science in Informal Environments: People, Places, and Pursuits*, Washington, DC: National Academies Press, 2009.