

Teacher Informational Letter

POCKETLAB HEATVIZ

What is the study about?

Myriad Sensors, Inc., (DBA PocketLab), is an educational technology and curriculum company located in Nashville, TN, and TERC, Inc., is a STEM education research and development non-profit located in Cambridge, MA. We've received funding from the National Institutes of Health (NIH) to develop and study HeatViz, a portable, highly sensitive temperature and location sensor that students can use to collect micro-temperature data in their communities, along with curriculum materials that support high school students in using these sensors to study urban heat islands and the health impacts of excessive heat associated with them. We are studying how these materials are used and their impact on students' understanding and attitudes.

Who is eligible to participate?

High school teachers who teach biology and/ or Earth or environmental science classes, and their students. The specific **content addressed** includes NGSS Disciplinary Core Ideas (DCIs) related to heat islands, such as core ideas related to water and climate (ESS2.C and ESS2.D) and ecosystem dynamics and human activity (LS2.C and LS4.D), as well as NGSS Science and Engineering Practices (SEPs) related to planning and carrying out investigations (SEP2), analyzing and interpreting data (SEP4) and arguing from evidence (SEP7). The activity is also aligned to Georgia Standards of Excellence related to human impact (SEV4.b)

The HeatViz units will also include content on the health-risks of heat islands, how these are inequitably distributed among different groups, and what might be done to address these risks, but we don't expect these to be topics in your regular curriculum.

What will teachers have to do for the study?

Teachers who agree to participate will have each of their classes **randomly assigned** to either the HeatViz *treatment group* (who will use the HeatViz sensors and materials) or to a "business as usual (BAU)" *control group* (who will teach related content in the usual way).

Because each class is assigned randomly, teachers may be asked to teach all classes with the HeatViz materials, all in the usual way, or a mix. We're planning to assign 50-60% of classes to the treatment group, so teachers are likely to get a chance to use these innovative materials with at least one of their classes. It's important for the study that classes are taught as they've been assigned. Teachers may be able to have all of their classes assigned to the same condition (either *treatment* OR *control* but not both) if they let us know that preference ahead of time and we assign them as a group. If teachers are willing, we'd prefer to assign by classes.

All teachers participating in the study will be asked to do the following:

- **Agree to have their classes randomly assigned into either the *treatment group* or *control group* and to teach them as assigned.**
- Participate in up to two 1-hour online orientations at the beginning of the study to introduce you to the HeatViz sensors and materials and to review the study requirements.
- Facilitate the distribution and collection of student and parent study consent forms.
- During the time that you would normally be teaching the GSEs listed above, complete brief daily online teacher logs that report on instructional activities that took place during lessons in your classroom.
 - For ***treatment group classes***, this will include use of HeatViz sensors and materials, as well as any other activities you do to address the standards.
 - For ***control group classes***, this should NOT include any use of HeatViz sensors and materials – it should ONLY be whatever you would normally do to address these standards.
- Facilitate the administration of assessments on science and engineering practices, and surveys around science engagement and attitudes to participating students in your classroom (~35-45 mins each administration).
- Complete an end of unit survey about your experiences (~20 mins).

If selected, a subset of teachers will be asked to do the following:

- Allow one to two researcher(s) from the research teams to visit your classroom in-person or virtually to conduct one classroom observation during the study or participate in a lesson debrief call.
- Participate in a 1-hour interview with a researcher around your experience in the study.

What about research oversight and school/ district permissions?

We have developed informed consent documents for teachers, parents/ guardians, and adult students, and informed assent documents for students. We assume that schools and districts may have their own processes for approving use of these materials and giving permission for the HeatViz study to go ahead. **We may need to work with teachers to get these permissions.**

Do I have to participate in this study?

No. It is completely voluntary. There are no penalties for you if you do not participate in this study, however, to have the opportunity to access the PocketLab app and materials and keep them after the study, you will need to complete participation. You also have the right to withdraw from the study if you change your mind later. There are no professional penalties for withdrawing early from the study, although compensation will depend on the extent of your completion.

Will my privacy be protected?

Yes. All identifying information we collect about you and your students will be kept confidential, will only be used for research purposes, and will never be shared outside the study team. After the end of the study, we will delete all personal information about you and your students from

the data set. The HeatViz sensor may collect location data about you and your students; however, this data is stored locally and not automatically shared with the research team. You will be prompted to enable location services when you start the app, and you will be able to set the location sharing settings for your students.

Are there any risks to being in the study?

We do not believe there will be any additional risks to you beyond those associated with your normal teaching duties.

Are there any benefits?

You will have access to the PocketLab system. Teachers with at least 1 class assigned to the treatment condition will use the HeatViz system in that class, and control teachers will get access to the HeatViz system after the study is done. There may or may not be any educational benefit to your students – that’s part of what we’re studying. The results of the study will contribute to knowledge around how educational technology resources can be used to support students’ learning of, and engagement in, science and engineering practices.

Will I be compensated?

All teachers who participate in the study, including training, facilitating research consents, teaching the assigned unit(s), administering assessments and surveys, completing teaching logs and final survey, will receive a stipend of up to \$400. Additionally, all participating teachers who complete the research study will receive a classroom set of PocketLab devices to keep.

I have more questions. Who do I contact?

If you have further questions about the HeatViz materials or this research study, please contact Clifton Roozeboom (clifton@pocketlab.com) at PocketLab or Jim Hammerman (jim_hammerman@terc.edu) at TERC. If you want to talk about the research with someone outside the project, please contact Santiago Gasca of TERC’s Institutional Review Board. He can be reached by telephone at 617-873-9758 or by email at santiago_gasca@terc.edu.