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SEISMIC MOMENTS AS TEACHABLE MOMENTS: OPPORTUNITIES FOR INTEGRATING BASIC RESEARCH, SCIENCE EDUCATION, AND CITIZEN SCIENCE

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A perennial question in educational seismology has been whether low-cost seismographs are only suitable for traditional educational purposes. Can they also offer opportunities for students and citizen scientists to be research partners in the scientific community? “Research” in this context doesn’t necessarily have to be “discovering a new seismic structure in the core” or “developing a method for earthquake prediction.” It can be any endeavor that involves using the scientific method to find out something new that hasn’t been known before. There are challenging questions regarding the culture of education that need to be addressed to make such collaborative research possible. But, challenging as those questions are, here I explore a more basic starting point for this discussion: To what extent are affordable seismographs technically capable of recording data at a level of quality that, given the right educational circumstances, authentic research is possible based on the recorded seismograms.

There are a variety of low-cost seismographs that serve these purposes to one extent or another. I have found the recently introduced “Raspberry Shake” (RS) seismograph to be ideal for such integrating of basic research, science education, and citizen science. Examples of such integrated research are highlighted at *raspberryshake.org*.

To motivate discussion of possibilities for such real science in classrooms or at home, I present examples of well-recorded RS seismograms, I explore possibilities for research based on those examples, and I invite the audience to explore other possibilities. (Preview, at: *Twitter.com/Weston_Quakes*.) As a framework for the challenge of finding a good fit for students and non-academics to engage in authentic seismology research, I envision four levels of engagement: 1. “Wow, we recorded that earthquake!?” as motivation for general interest in learning science; 2. Actually studying what’s recorded by their own seismograph and exploring how real data compares with textbook-level science education; 3. Contributing their data to the community of professional scientists; and 4. Actually doing their own research with the data. All of these levels of engagement can advance scientific inquiry for students and non-academics if professional seismologists are willing to be their guides.