

Sean Allen  
Field Notes

I am an intern with the Network for Earthquake Engineering Simulation (NEES) who is fortunate enough to also participate in the SURE program through SCEC as well. The research I am completing for both internships is the Make Your Own Earthquake (MYOE) lesson plan activities. The MYOE activity was initially developed by UCSB staff. For this activity, educators would go to local schools for science fairs and back-to-school nights and perform the activity with the students. Students would be allowed to jump up and down for ten seconds, and be given a print out of their “earthquake.” Originally, the MYOE activity required an accelerometer, a datalogger, a laptop and a laser printer to record the earthquake., this is the same type of equipment that was used in the field. This equipment is very heavy, very expensive, and takes at least an hour in order to be setup for the activity. Thankfully, advance in technology have made this process a lot easier.

The Quake-Catcher Network (QCN) has developed a small device (~1 – 1.5 inch cube) that does exactly what the professional equipment from above does and can be seen below (Image 1). This little box has a Micro-Electro-Mechanical Systems (MEMS) accelerometer built into it. The accelerometer is the same kind of accelerometer that can be found in iPhones and some laptops. This MEMS accelerometer picks up all of the vibrations that the students create while jumping. The QCN device also comes with a free cross-platform software in order to record and print out the student's earthquake. The software can work without the device and just use the accelerometer that may be built into a laptop. The QCN device is available for purchase on the QCN website (linked below) and only costs \$5 for teachers. The simplicity of the device and the cost make it a practical tool to be considered for normal classroom use.



Image 1: Quake-Catcher Network Device

The research that is being conducted by Heidi Pence, Joseph Trudeau, and myself this summer involves creating lesson plan activities for K-12 students centered around the QCN device. According to the USGS, California is the second most seismically active state. This is why it is important for earthquake education to take place in the classroom. By using the QCN device, we hope that a hands on learning environment will help students to better understand the lessons that are being taught to them. We have looked closely at the California Science Standards in order to ensure that our lesson plans will be applicable and appropriate in the classroom.

Another focus of ours is the overall presentation of the activities. We were able to sit down with a middle school science teacher and talk to her about what teachers like and dislike when it comes to

activities. It became apparent to us relatively quickly that the science content of our activities were not the only thing we needed to focus on in order to have the activities adopted in a classroom. Our meeting produced a recipe-like template that would be easy to follow and not too wordy. It was also important that our activities provide enough background information on the subject for the teacher to feel comfortable teaching the activity.

Our research so far has shown us the versatility of the device as well as its limitations. By running through the experiments ourselves, we have been able to work out a lot of the issues with the device and the activities. However, we plan on having a focus group with students within the next two weeks in order to really help discover what works and what falls short. By the end of summer, we hope to have a set of activities that are easily accessible (available online) and eventually widely used in the classroom.

Quake-Catcher Network device website:

<http://qcn.stanford.edu/learning/requests.php>

UCSB Make Your Own Earthquake website:

<http://nees.ucsb.edu/outreach>