

# What did you say?

## Visually impaired students using bonephones in math class

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### Introduction

**Bone-conduction headphones** were deployed along with **audio splitters** for use with an auditory graphing software program in a classroom for the visually impaired.

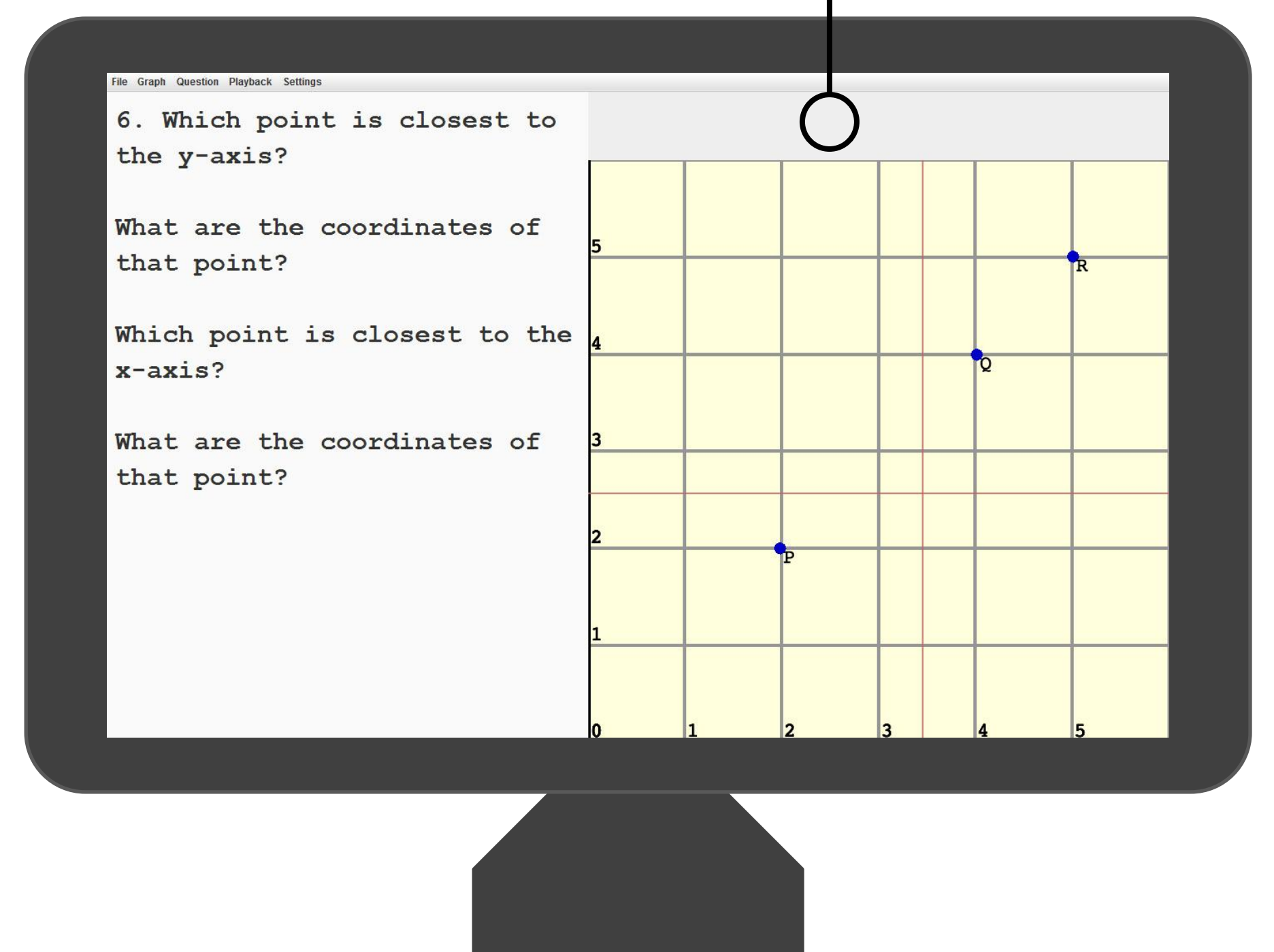
**Who:** 5<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> grade math class + the teacher  
**When:** Fall 2012 – Spring 2013  
**Where:** Georgia Academy for the Blind (GAB)  
**How:** semi-structured interviews with the teacher, focus groups with the students, and classroom observations.



### Results

- compared to air-conduction headphones, students were **more likely** to keep the AfterShokz headsets on throughout the entire lesson
- a majority of the students as well as the teacher **preferred using the bone-conduction headphone** over the air-conduction headphone
- providing the audio splitters allowed the teacher to **more quickly assess** where a student was experiencing difficulty
- the teacher was **more likely to pair students** to work together when audio splitters were provided

The **Graph and Number line Input and Exploration (GNIE)** auditory graphing software allows users to navigate on a number line or coordinate plane



#### Quotes from the study:

[the splitter] was priceless. I like that a lot. Because, the problem was I would forget that I had that option and then I go “duh”, plug in, and of course I could *see right away the problem they were having*. So it was just like it explains everything so much better when you hear what’s going on there. So that was just great.  
- Teacher

[I think it’s cool ‘cause if your teacher says “It’s time to go [to the next class]”, you can still hear them. And then, it’s still kinda in your ear so you can hear that [the computer audio] at the same time, and it makes it a lot easier.  
- Student

They’re easy for me to put on, but they kind of distracts you because you can’t – ‘cause you want to block out the sounds people make – people around you because sometimes people are loud and you can barely hear what you’re doing ‘cause they’re loud.  
- Student

### Discussion

Audio splitters and bone-conduction headphones are not normally considered assistive devices, though when used in a classroom for the visually impaired, they offer many benefits. The main benefit of audio splitters is to quickly allow pairs (or even trios) to share the same audio environment. This is helpful for a teacher who is helping a student and also for students who are working together on the same problem. Bonephones do not block the ear canals, an important route for receiving information by visually impaired students. With bonephones they can listen to their screen reader while also being receptive to environmental input.