### **Researchers find way to target sound to individuals**

The way in which we listen to music and hear sounds has changed over the centuries. Today, we have state-of-the-art, noise-cancelling ear buds that provide the highest quality aural experience. In the near future, we will be able to listen to music in public without headphones. New technology is being tested that can aim beams of sound at individuals, without people next to them hearing. This means we could be having private conversations in public without others listening in. A team of researchers at Penn State University in the USA developed an innovation called "audio enclaves". The ultrasound waves used for these enclaves cannot be heard en route to the recipient. In addition, the waves can be bent to get around obstacles.

The researchers spoke to the website "The Conversation" about their work. Lead researcher Jiaxin Zhong said: "We essentially created a virtual headset. Someone within an audible enclave can hear something meant only for them, enabling sound and quiet zones." He elaborated on the potential uses of the technology. Museums could provide headphone-free audio guides to visitors. Passengers in a car could listen to music without distracting the driver. Those requiring confidentiality could set up enclaves to ensure their conversations are not overheard. Individuals could also receive personalized ads as they walk through a shopping mall. In addition, audio enclaves could be set up to eliminate noise pollution in busy workplaces.

**Homework:**

1. Write a full sentence answer for each question below.
2. What state-of-the-art things do we use today?
3. When will we be able to listen to music without headphones?
4. At what institution do the researchers work?
5. What is the headphone-less innovation called?
6. What can the sound waves be bent to get around?
7. Who did the researchers talk to?
8. Where could people listen to headphone-free audio guides?
9. Who might receive fewer distractions because of this technology?
10. What could we receive as they walk through shopping malls?
11. Where might the technology be set up to eliminate noise pollution?

**Free Writing**

* Write about the lesson page for 10 minutes.