

LOUDSPEAKERS, PA SYSTEMS, AND THE “WALL OF SOUND”


Est. Time: 90-120 minutes

Subjects: General Music, STEAM

Age Range: All Ages


See the full lesson [here!](#)

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How does a loudspeaker work, and what was the Grateful Dead's influence on this technology?

In this lesson you will:

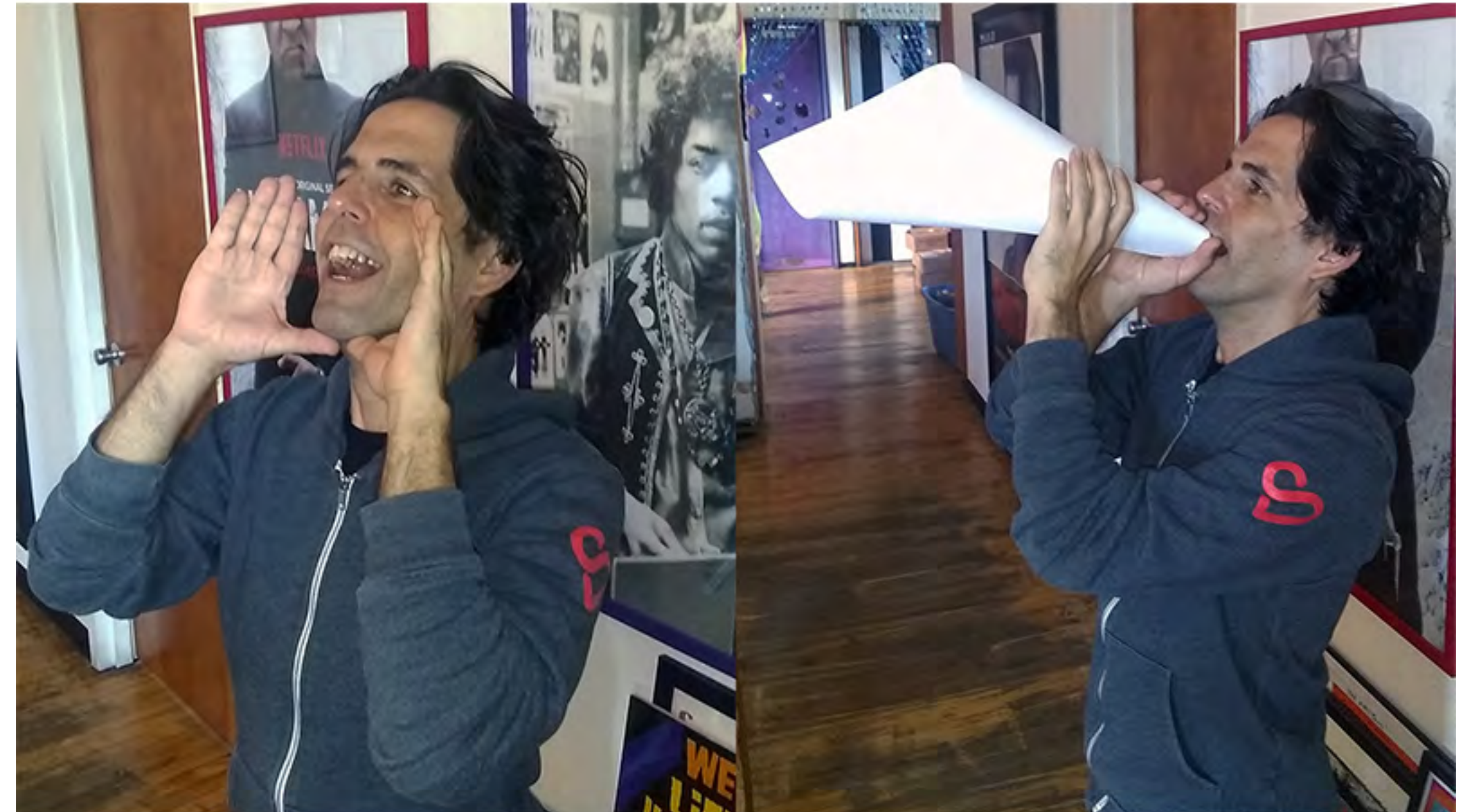
- Find out what a PA system is and identify its three basic components
 - Learn the science behind loudspeakers
 - Discover the Grateful Dead's historic role in pioneering live sound technology for concerts
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Consider or talk with a friend:

- Have you ever seen a concert or live music performance?
- How is the sound amplified at a concert?
- How is sound projection important when there is a very large audience?
- In a simpler way, how can you project your own voice to make it louder?

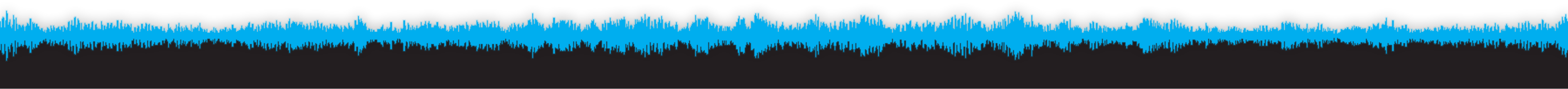


Experiment with projecting your own voice. Try speaking or singing in different rooms or through different devices to see how your voice changes.

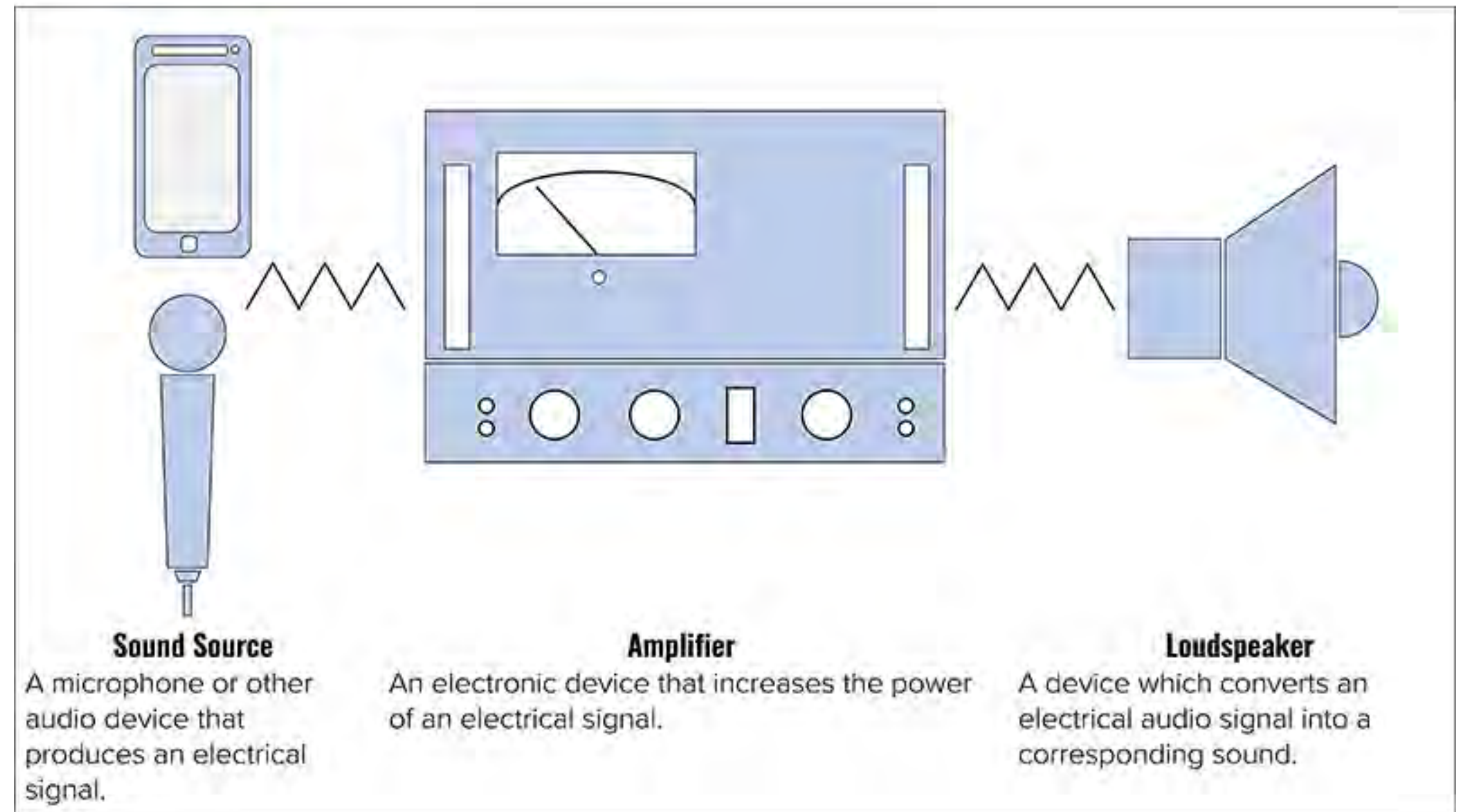




Consider or ask a friend:


- What ideas did you try when you experimented with projecting your voice?
 - What were your results and what did you learn?
 - What are some situations where sound needs to be louder and projected farther than is possible without electronic equipment?
 - Do you know of any electronic sound systems that make sound louder and project it farther?
 - Is there a sound system in your school for events and to broadcast announcements?
 - Do you know what that sound system is called?
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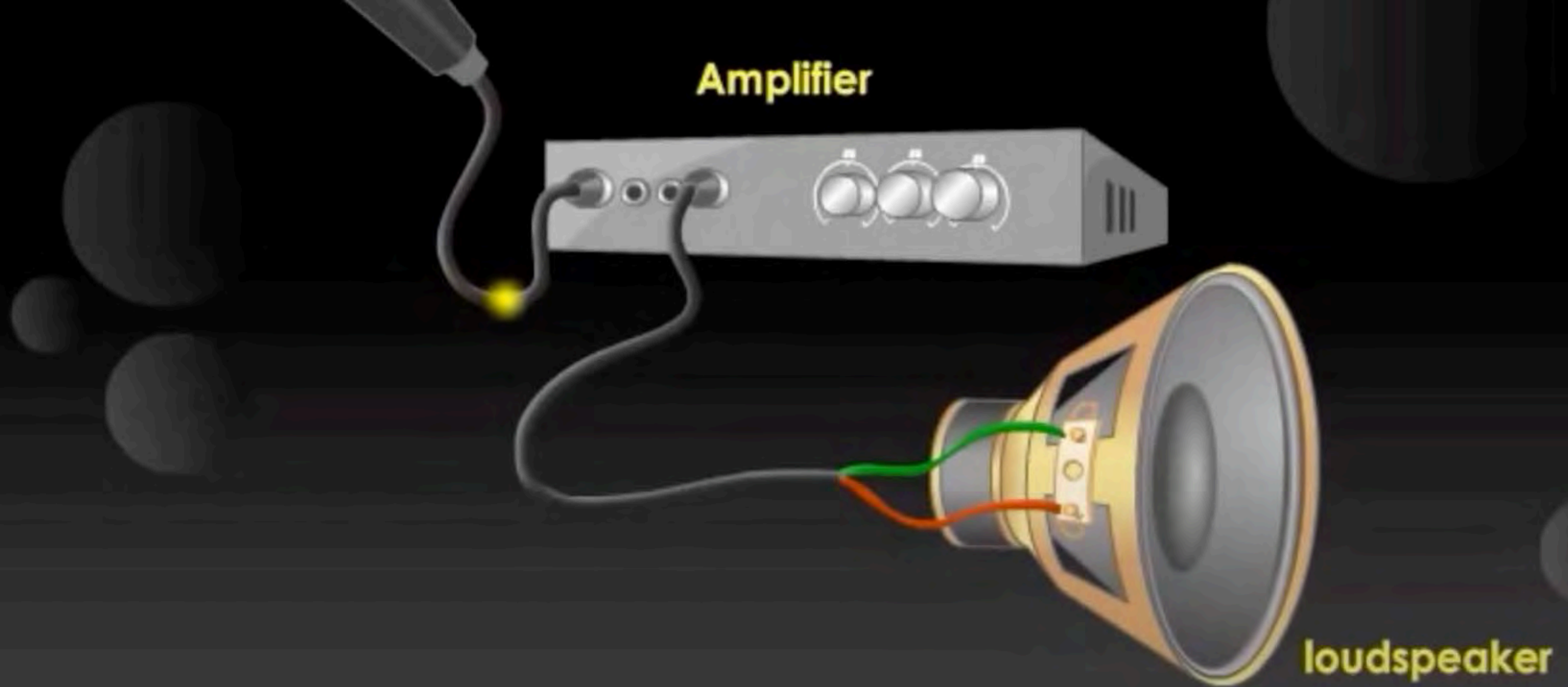
Examine this illustration to familiarize yourself with this infographic highlighting the basic components of a public address system.





Consider or ask a friend:

- How many components comprise a basic PA system?
 - What does each component do?
 - Are you familiar with any of the components? If so, which ones?
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PUBLIC ADDRESS SYSTEM

Watch [this video](#) explaining how a public address system functions.



Consider or ask a friend:

- Do you think a PA system requires specialized knowledge and training in order to assemble and operate?
 - What is the final component at the end of the system that produces sound that we can hear/sense?
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Have you ever wondered how a
loudspeaker is made? Check out
this video.





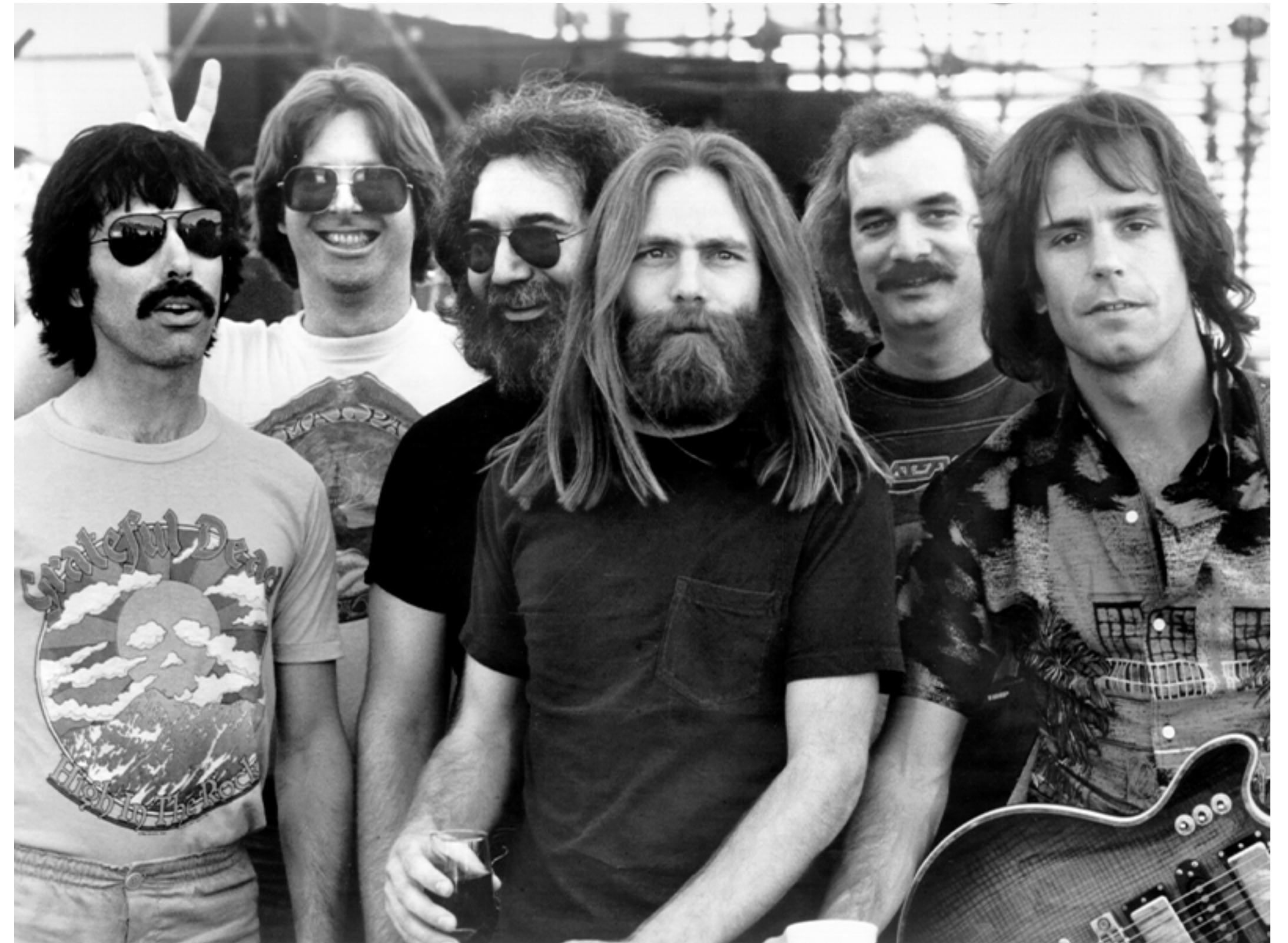
What surprises you about this process?

Do you think that it's possible to build your own loudspeaker at home?



Having an excellent PA system is important, especially to performing musicians and bands.

The Grateful Dead are a band known for large festival-style concerts. As the size of their concert audiences exploded early in their career, they pioneered the development of modern PA systems for music concerts so everyone could hear what musicians are playing.




In 1973, the Grateful Dead assembled the largest mobile PA system in the world, known as the “Wall of Sound.”

Check out [these amazing photos](#) of the legendary PA system, and then watch [this video](#) about the construction of the wall of sound.





Consider or talk with a friend:

- Why did the Grateful Dead build the Wall of Sound?
 - Why do you think the band and its crew built the Wall of Sound themselves instead of hiring someone else to build it?
 - How do you think fans responded to the Wall of Sound?
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SUMMARY

- Public Address (PA) systems produce sound for events like concerts, plays, and sporting events
- PA systems have three main components: the Microphone (or another sound source), the Amplifier, and the Loudspeaker
- Loudspeakers consist of three main items, the Basket, the Magnet, and the Voice Coil
- The Grateful Dead assembled the Wall of Sound in 1973. It produced excellent sound and allowed the band to play to huge crowds of fans



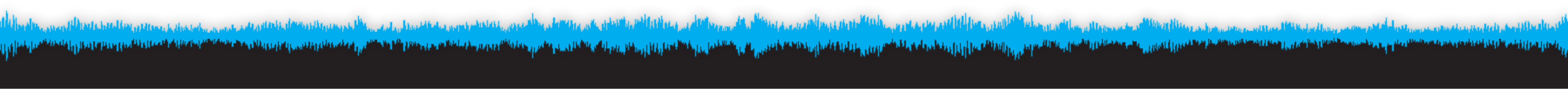
BE CREATIVE

- Create your own infographic describing how a PA System works, and include some of the info that you learned in this lesson. **This infographic** can be used as inspiration. Be sure to make your infographic colorful and informative.
- Create a self-portrait of yourself being “Blown Away” by great sound. Use **this TeachRock Handout** to help you get started.



BE CURIOUS

Check out [this video](#) to learn how to make your own loudspeaker. After watching the video, check with a parent, guardian, or adult in your life first to make sure that it's okay with them and that you have all of the materials.



BE CURIOUS

Check out the TeachRock Lesson **“Feeling the Vibrations”** to learn more about The Grateful Dead and how they helped deaf and hard of hearing fans.



CAREER CONNECTIONS

Interested in speaker manufacturer and design? You might be interested in pursuing careers in:

- Product Innovation and Design
- Engineering Design
- Mechanical Systems Installation and Repair
- Engineering Technology



CONNECT

Share with us! Either you or an adult in your life can share your filled in handout, art piece, or singing video with TeachRock on **Instagram** or **Facebook**, email to **info@teachrock.org**, or Tweet it to **@TeachRock**





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