

Facilities (Learning Spaces)

# The Importance of Auditorium Acoustics

By [Jonah Sacks](#) May 1st, 2014

The auditorium is a central and important space in any high school lucky enough to have one. It is used for all types of formal assembly: lectures, award ceremonies, dramatic plays, musical theatre productions, concert performances of orchestra, band, chorus, jazz band, battles of the bands, dance competitions and so on. These varied events place a range of demands on the room. For all events, it is essential that everyone in the room hear, clearly and enjoyably, everything that is presented. This is the goal of acoustical design for auditorium spaces.

The acoustical design of an auditorium is different than that of any other high school space, because of the specific demands of the performing arts, which distinguish the auditorium from a common lecture hall. The auditorium will provide many students their first introduction to performing arts, both as audiences and as performers. We would like for this introduction to be a positive one, and we strive to provide a space that is highly functional, artistically flexible, easy-to-use and satisfying for performers and audience.

Dramatic theatre productions — Shakespeare and the like — rely on clear and easy intelligibility of actors' speech and a natural connection with the audience. For most plays, it is important that this be achieved without the use of voice amplification. Similarly, concerts of orchestra, chorus or band showcase the natural, unamplified sound of these ensembles in the hall. These concerts require acoustical blend and reverberation as well as clarity, and these are best achieved through natural acoustics.

Jason Luciana, choral director at Wilmington High School in Wilmington, Mass., prefers to avoid amplification for choral concerts. For a cappella groups, he uses microphones for soloists, but will only resort to mic'ing the group "if something about the room is off." In musical theatre productions, actors and featured singers are mic'ed, both for balance with the pit orchestra and for artistic reasons, to facilitate a Broadway stage singing style.

Drama teacher Adam Brown, director of theatre at Newton North High School in Newton, Mass., wants his students to learn to project their voices and be heard without amplification, and also to perform effectively with amplification when appropriate. He views proper acoustical design as a necessity and a wise investment: "The last thing any school director wants is parents who cannot hear or see their children perform."

The acoustical design of the auditorium in the new Newton North High School includes appropriate room size and shape, well-placed sound-reflecting surfaces, and a properly designed sound amplification system. It also includes careful sound isolation from nearby school spaces and a very quiet mechanical (HVAC) system. Providing quiet background noise conditions is among the most important tasks of the acoustical design of any performance space, including educational spaces, as it allows student performers to learn to use their full dynamic range, and helps audiences to focus on the performance.

Acoustical design of an auditorium addresses many aspects of room and building design, and is tightly coordinated with architectural and technical theatre design. As theatre design consultant Martin Vinik observes: "The same pendant ceiling panels that provide the reflective surfaces for optimal acoustical performance mask our auditorium lighting catwalks, conceal architectural downlights while allowing easy access for maintenance, and help to diffuse air that drops down from exposed supply ducts above." He adds that good design need not be expensive, and in fact may, "save the owner precious capital funds and make life easier for everyone who works in the theatre."

A well-designed high school auditorium can outlive the school in which it was built, as in Greenfield, Mass., where the well-loved 1957 high school auditorium will receive a renovation, while the rest of the school is rebuilt around it from the ground up. In this way, good design, including acoustical design, will continue to pay educational, artistic and financial dividends for decades to come.

— The author thanks Nicole Cuff, Chris Savereid, and Ioana Pieleanu of Acentech for their contributions.

This article originally appeared in the [May 2014](#) issue of School Planning & Management.

## About the Author

Jonah Sacks is a senior consultant in acoustics at Acentech Inc., where he leads the Studio A division focused on the performing arts. He can be reached via [www.acentech.com](http://www.acentech.com).

 [Printable Format](#)  [E-Mail this page](#)

## Related Articles

- [Do Classrooms Have To Be Designed A Certain Way?](#)
- [What a Waste!](#)
- [Music Rooms? No, Performance Spaces.](#)
- [Flexible Music Rehearsal Environment](#)
- [Proper Planning Ensures Sound Results](#)