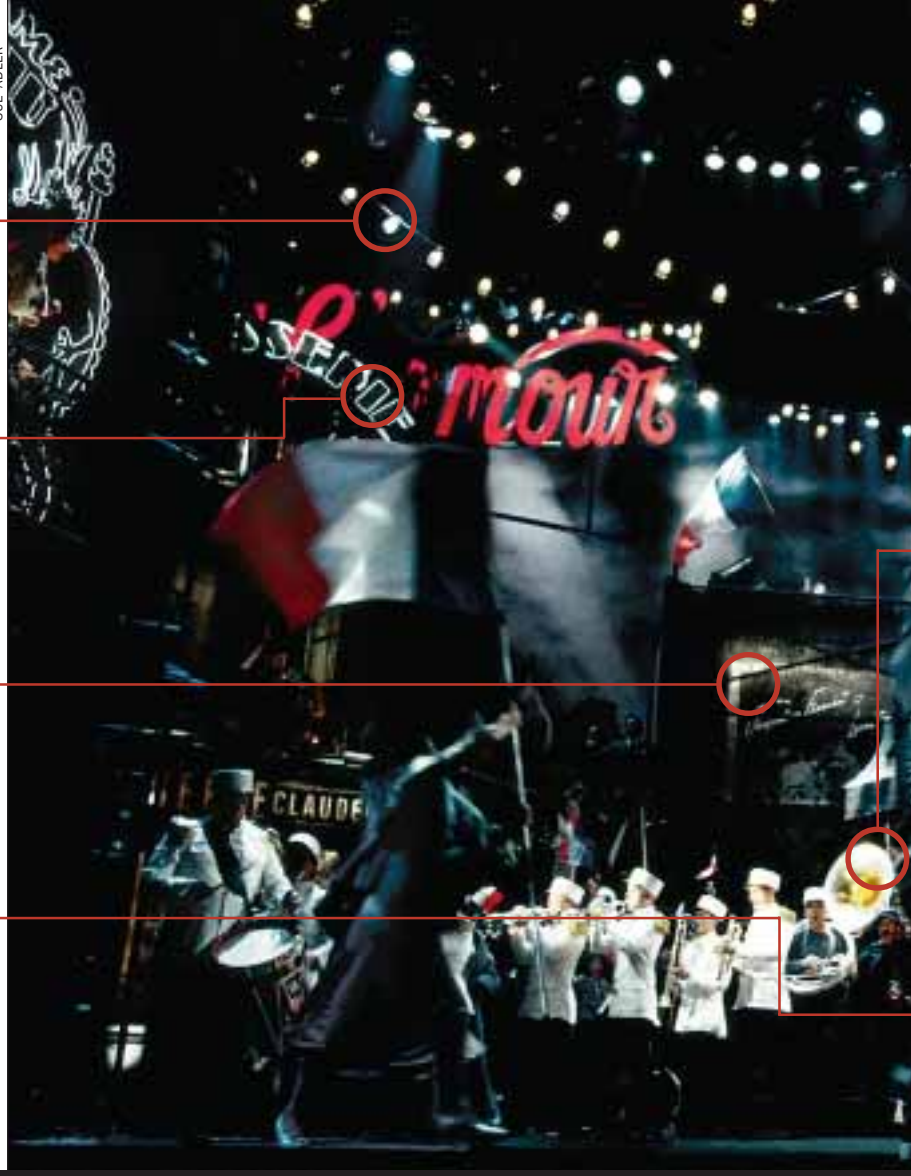

Lighting and sound embrace **physics, math**, **electronics**, **electrical systems**, **visual art**, **music**, and **drafting**.

Will the rigging support the weight you want to fly? You'll need **physics, calculus,** and **trig** to be certain.

A solid background in **history** and **literature** will inform your work on period shows or theatre with a rich cultural context.

If you find yourself in the costume shop—or just need to make emergency repairs—the skills you pick up in **home ec** will come in handy.

LAYING A FO

What you can be doing now to prepare

BY DANA

SENIOR ENGLISH MAY COST you two hours of reading Shakespeare every night. A physics assignment might well require staying up until 3:00 a.m. building a toothpick roller coaster to demonstrate inertia. In home economics, there's a good chance you'll be re-hemming the same pair of pants four times.

But as the credit card company might say, knowing that all this work will make you a better entertainment technician is priceless.

Many entertainment technicians come to a decision about their chosen profession during their high school years, spending countless hours backstage. They work long nights, weekends, holidays, and they love every minute of it. Later, college study or professional work can produce some unpleasant surprises for

Building the set: you should know something about **carpentry, welding, metalworking, painting, sculpture, math,** and more.

Musical training will help you make good choices as a lighting or sound designer for musicals, opera, or dance.

A knowledge of **chemistry** will aid you in working with a wide variety of paints, solvents, and adhesives needed to make scenery sparkle.

The 2002 Broadway production of La Bohème.

OUNDATION

e for a career in design and production

A TAYLOR

these hard-working, often highly skilled technicians when they discover there are gaps in their knowledge, important things they don't know, or can't do, or are unprepared to learn.

It's never too late to learn, but those of you who are still in high school have a chance to get it right the first time, pursuing courses of study that will provide you with the foundation of knowledge to build a good education and improve your chances of having a successful career in entertainment technology.

What classes?

Although there are no classes that you might take in high school that will *hurt* your chances of being a successful entertainment

technician, there are many that will be more usful to you than others. We recently asked industry professionals two questions: "What classes did you take in high school that have helped you during your career?" And: "What classes do you now wish you had taken?"

These individuals offered responses ranging from typing to personal finance. Here are their suggestions, compiled into a top ten.

1. Mathematics: algebra, geometry, calculus, and trigonometry.
2. Industrial technology, including metals and welding, woodworking, electricity, electronics, robotics.
3. Technical drawing and drafting, both hand drafting and computer-assisted design.
4. Visual art: drawing, painting, sculpture.
5. Instrumental or vocal music.
6. English composition and literature.
7. Sciences.
8. Personal finance and office skills.
9. Home economics.
10. Social studies and history.

Knowledge is power

If some of these subjects seem only tenuously connected to the skills needed for focusing an ellipsoidal, stay with us while we review just some of the ways these diverse studies can contribute to the education of a well-rounded member of the design and production team.

Why math? There is little work done in entertainment technology that doesn't involve mathematics. Algebra is used in electronics, in formulas used for structural analysis, and as a basis for understanding all of the other mathematical disciplines.

Geometry is useful in audio for understanding the concept of speaker dispersion. In lighting it aids in developing an understanding of beam angles and throw. Scenic design is influenced heavily by geometry in regard to the ability to envision and work with scenic elements in three dimensions. Even costumers use geometry; just ask one who has tried to construct a hoop skirt.

Calculus and trigonometry are essential to stage rigging in the calculation of forces and in structural design.

Why industrial technology? Welding, woodworking, electricity, and electronics were each mentioned as essential classes for the aspiring technician. Each is commonly used in entertainment technology and a working knowledge of these disciplines will only aid you in your college or professional work. As a designer, your knowledge of how to build things, how component parts function, and how much things cost will greatly enhance the practicality of your designs.

Why technical drawing? Whether it's hand drafting or a CAD-based program, the ability to communicate your ideas using technical drawings is essential for designers and technicians. Even if you don't design scenery, sound, or lighting, you will need to be able to read and understand the drawings created by others. Commonly used computer programs within the entertainment industry are AutoCAD, LD Assistant, Vectorworks and WYSIWYG.

Why visual art? Drawing, painting, sculpture, and other forms of visual expression strongly impact the work of technicians. Scenic painting is an obvious skill nurtured by this training. Equally important is the ability to create renderings of sets, costumes, and storyboards. Visual art training also develops skills needed for the design and manufacture of props, set dressings, and scenic elements, and the very prized skill of scenic model construction. Just as drafting is becoming increasingly digital, so is the visual art used in theatre production, as computer-generated graphics used as scenic surfaces and projections are becoming more common.

Why music? One obvious benefit of musical training is the ability to understand and respond to the structure of songs for lighting design. Less obvious will be the ability to follow a score when working in opera, musical theatre, or dance productions. For the sound designer, knowing how to plan speaker and microphone positions is only a portion of the job. Also important is your understanding of music in an aesthetic and historical sense. Making informed musical choices for underscoring and interludes will enhance the quality of your work and your chances for employment.

Why English? The benefits of English and related subjects are two-fold. First is your ability to effectively communicate your ideas, either verbally or in writing. Proper use of language influences how others perceive your intelligence and may be the deciding factor in your acceptance into a college program or being hired for a job. Secondly, theatre is literature and your ability to understand an author or playwright's intent is crucial for scenic and lighting design. Further, a good knowledge of literature will allow you better to speak the language of directors, designers, and playwrights.

Why science? Although you may not be required to dissect a frog as part of your work, biology is often the first step in a scientific education that will lead to chemistry and physics. The understanding of chemistry will assist you in working with materials commonly found in the scene shop—an endless variety of paints, solvents and adhesives—and encountered in atmospheric effects like fog and haze. It will also aid in better understanding material safety data sheets (MSDS). These sheets, like a warning label on a pill bottle, describe in great detail the component parts of what is being used, and describe safe practices for their application and disposal.

Physics comes into play when dealing with rigging and automated scenic elements. Your ability to calculate forces created by hanging a twelve-foot truss with two bridles can literally mean the difference between success and disaster.

Why personal finance and office skills? Many entertainment technicians are self-employed and essentially run their own businesses. They must be able to plan a budget, balance a checkbook, file taxes and maintain the records that entails, understand contracts—all fundamental business skills. Office skills will also be a plus. Typing, record keeping, and the use of various office software products will help you stay organized and productive.

Why home economics? You may not have to cook dinner for the crew but home economics is helpful when you are facing "wardrobe malfunctions" or other scenic problems. The hands-on skill of sewing will serve you well in the design, creation, and repair of costumes and will provide you with an understanding of the different kinds of fabrics. Directly related to this is the ability to create or repair scenic drops. Tears and fraying are common problems with backdrops and often they are too costly to replace. Sixty feet of gaffer's tape will not hold the webbing to the top of your cyc.

Why social studies and history? If plays are literature, they are also history. Being acquainted with a given script's historical and social context will greatly enhance your ability to design elements of the play effectively. An understanding of the historical forces that influenced playwrights from Shakespeare to Chekhov is essential to effective design, as is, for scenic designers, a good grasp of architectural conventions throughout history.

There is also the parallel history of theatre production. Knowing something about what has gone before us in technical theatre techniques, terminology, and equipment lends an illuminating perspective about the work that you do.

There are two additional skill areas that were not specifically mentioned by the survey participants but are of great importance to any student planning on attending college or joining the workforce. These are, first, fluency in a broad range of computer applications, and second, strong research skills.

Most high school students have received training in computers and software applications but often they will need to take it a step further. In addition to the design software mentioned above, many employers and colleges will expect you to be able to use common word processing and spreadsheet programs like MS Word and Excel. It is to your advantage to gain proficiency in them.

Similarly, research skills are a core component of many college courses. Research is also usually the first tool you pick up when you begin working on a design assignment. Your ability to do effective research will make your academic life easier and enhance the quality of your professional work. Whether you are wandering through the stacks at the library or surfing the Web on your home computer, you will need to know how to find information, how to judge its quality, and how to effectively apply it to your work.

Implementing your curriculum

There will be challenges in developing a course of study that balances your educational objectives with your school's graduation requirements, college admission guidelines, and available courses. You will be required to take some of the classes recommended here; you may not be able to get into some others. And it is likely that you may not excel in all of them. However, every class you take can play a positive role in the pursuit of your goal.

Real practical experience is important, too, and you should look for that while you are pursuing your academic education. One option that may be available to you is a "school-to-work" class. In classes like this you spend a portion of your day working in the community. Should this be available, you could seek out opportunities to work at a local professional or community theatre.

Look for any opportunity that will put you in a theatre or performing arts venue. There are many benefits to be gained by working as a theatre teacher's assistant, volunteering to help with community theatre productions, working with a local band, or assisting with audio and lighting at a church. In each instance, you will gain the one thing that you lack, experience. Knowledge gained from experience and through a well-planned education is the foundation for a rewarding and successful career, in entertainment technology or any other field.

Dana Taylor is our new technical theatre editor. An instructor of tech theatre at Mt. Vernon (Indiana) Senior High School, he co-chairs the Publications and Assessment Committee for the Entertainment Services and Technology Association Foundation.