**Course Descriptions:**

**Area I:**

**Choral Music:**

The Choral Music curriculum will focus on the exploration of traditional vocal techniques as well as modern technological developments and their application to choral and vocal art forms. Vocalists will have the opportunity to perform and record music from classic and contemporary repertoires. Students will use cutting-edge software to develop compositions and recordings, and examining its use and impact on the art form. Students will also experiment with and discuss music-specific web-based applications as well as the advantages and disadvantages of digital and analog performance in general.

**Drama:**

Drama is one of our oldest art forms, yet it continually evolves in order to meet to the needs of our changing society. Students will learn to analyze and create dramatic works that speak to the audiences of today. They will learn about dramatic principles through the analysis of 21st Century dramatic texts, through the practice of performance skills, and through the writing of scripts. This course will touch on a variety of skills relevant to today’s theatre-makers which might include acting, directing, playwriting, design or old-school genres such as clowning and puppetry. Students will also have the opportunity to experiment with digital film, audio, and editing and examine the differences between performance for stage, screen and hand-held device.

**English/Language Arts:**

English/Language Arts will offer students opportunities to explore the art of rhetoric as writers and readers of literature, as well as viewers of film. Students will balance reading and discussing published works with composing their own writing in order to make their voices heard. Students will examine and compose traditional genres such as poetry, short fiction, and creative nonfiction, but they will also explore creative writing in areas related to media, such as television writing, screenplay writing, social media, and flash fiction / creative nonfiction (ex: a Twitter narrative of 140 characters or less). Students will also discuss uses of technology in sharing and promoting their work, including e-book publishing, social media, and online marketing. Students will finally examine the challenging and complex process of altering a story told on the page into a story shown on the big screen. Students will study examples of film adaptations in which the writer took part in the movie making process as well as examples in which the writer had no part in the process.

**Instrumental Music:**

The Instrumental Music curriculum will focus on modern technological developments in sound design. Instrumentalists will have the opportunity to perform and record music, and to learn how to mix and manipulate dynamic soundscapes for live performances. Although the technological focus will be contemporary, pedagogical applications of new technology may be used to enhance musics from a wide variety of style periods and genres. Students will analyze the latest technological applications in the field, focusing on the advantages and disadvantages of digital vs. analog recording and mixing.
Mathematics:

Students in Mathematics will explore mathematical ideas and applications in three areas: biological science, cryptography, and complex numbers. In mathematical biology, students will explore topics such as the topology of DNA, cell physiology, the study of infectious diseases, population ecology, neuroscience, tumor growth and treatment strategies. Students will venture into the field of mathematical modeling and debates its usefulness to biomedical sciences. In cryptography, students will examine some of the latest theories. For example, lessons on the Rivest-Shamir-Adleman technique or simply RSA can give insights into systems for the secure transmission of data. The numbers used in the RSA system are actually so big that factoring them would take millions of years; even using a supercomputer! In complex numbers, students will discover the mathematics and beauty of complex numbers and the complex plane through explorations of fractals. The study of the mathematics behind Julia sets, Mandelbrot sets, conformal mappings, and the Koch Snowflake could set the foundation for students pursuing mathematical creations and discoveries of their own.

Natural Science:

Students will study some recent technological breakthroughs in the natural sciences that are currently the source of tremendous debate. Discovery of the 3-dimensional atomic structure of DNA has led to greater understanding of genetic sequence and regulation. Applications in the areas of medicine, food production and industry are multiplying, but they pose crucial ethical questions, including whether human cloning undermines the value of human life. Hydraulic fracturing is another technology that led to controversy. It has led to greater production oil and gas and has reduced the United States’ reliance on coal and imported oil but at a cost to water systems and tectonic stability. These convenient and controversial technological breakthroughs as well as others involving fisheries and wildlife management, lasers and holography, and many other areas will be the subject of exploration in the natural sciences.

Social Science:

Students in the social sciences will study what it is to be human. In anthropology, sociology, psychology, rehabilitation science, political science, history and other fields in the social sciences, technology is changing the subjects of study as well as the methodology of studying them. Current technologies such as geospatial mapping can change the way we envision cultural development. Meanwhile, the internet has created the possibility for cyber-societies, cyber-crime, and cyber-consumption. Behavioral neuroscience uses new digital models to provide insights into how humans see our world. At the same time, human minds and bodies are augmented by hand held computers, performance and mood enhancing drugs, and robotic prosthetics. Students will study these subjects and technology’s effect on them.

Specialty-Cyber Security:

The specialty program in cybersecurity provides a unique opportunity to governor’s school students. Cybersecurity is an interdisciplinary field encompassing mathematics, science, engineering, and technology. Students will understand the importance of this emerging area of study and will examine why cyberattacks cost the average U. S. company over $15.4 million per year in losses. Data breaches, malware infections, and software vulnerabilities are all too common and prevention and recovery are needed for a stable economy and reliable national defense systems. This course will provide an introduction into the world of cybersecurity, provide hands-on classes in programming, wireless technologies, mathematics, and networking, and explore the ethical and social implications of the field.
Visual Art:

The Visual Arts program of the Arkansas Governor’s School will give students an opportunity to inform and expand their creative vision while exploring new techniques. The goal of the program is to blend traditional fine art media and craft with emerging technology. Students will investigate correlations between the physical art object or process and the digital world. For example, in weeks one and two, students might combine traditional sculpture techniques with 3D printing to create video game characters. In weeks three and four, students might use motion capture technology to digitally animate their characters and make them dance. Students will participate in discussion, critique and critical examination of their work, the work of their peers and the art world in the larger historical and cultural context. The Visual Arts program will also confront the ramifications of technology as both a disruptive and constructive force in the expression of truth and beauty.

AREA II:

Area II will focus on the paradigm of the “network,” or a group or system of interconnected people or things. High school students utilize global networking technology such as Facebook, Twitter, Instagram, and Snapchat on a daily basis, making an inquiry into networking and its broad, humanistic implications relevant in an increasingly global and interconnected world. Students will consider their existence as technology augmented human beings and the myriad relationships between technology and modern society. Students will examine the ethics of biotechnology, artificial intelligence, and many other emerging innovations. In addition to informed debate and discussion about issues surrounding networks and technology, students will consider classic questions of ethics, politics, history, and philosophy that continue to affect contemporary culture.

AREA III:

Area III is designed to foster the personal and social development of students. Classroom activities will include critical thinking exercises, personality assessments, and group discussions centered on both philosophical and real-world challenges arising from a “connected world.” For example, students will be presented with a series of scenarios that focus on the role of technology and social media in their lives, with an emphasis on understanding the costs and benefits of such a connected world. Problems such as cyber-bullying, sexting, or other misuses of social media will be framed in a context that affords students the opportunity to understand the long-term consequences of such practices for themselves and others. Students also will be presented opportunities to use technologies and learn statistics methods that allow for the identification of social networks through relatable examples (e.g., the social networks of the Marvel Universe). At the same time, students will learn how to anticipate broader social trends through the use of publicly available data (e.g., Google Analytics). In addition, students also will learn more about how technology now plays a role in social protest and coalition building to foment public support for or protest against a variety of issues. Students will learn through experiential coursework involving discussion groups, volunteer opportunities/civic engagement, and project based work meant to impart a grounded approach to problems and foster a sense of personal responsibility and responsibility to others. Students will actually work on problems specific to their communities, at the same time developing their own leadership potential.