

# THE FOUR RIVERS CURRICULUM

What follow here are descriptions of our classes – the specifics are for illustration purposes and they may change as we revise from year to year. The academic curriculum at Four Rivers Charter Public School is aligned with the Massachusetts curriculum frameworks for English Language Arts, Mathematics, Science and Technology, History and Social Science, Spanish, and Wellness. Its real shape, however, comes from our faculty working together to mold the Four Rivers mission, Expeditionary Learning Core Practice Benchmarks, and the state frameworks into our unique program.

## MIDDLE SCHOOL

### English

*English in the Middle School is taught in coordination with Social Studies in a double-period class each day. English Language Arts skills weave through all the activities: listening, speaking, reading (both fiction and non-fiction), and writing. Students ask themselves such questions as: How can I support and organize my ideas so that they are clear for different audiences? How can I add my voice to my writing? What makes a piece of writing fun and interesting to read? What are the rules that separate formal and informal English? Why do I need to learn them? What are the social and reading skills needed to participate in a great book discussion? Much of the reading and writing that students do in this class connects with their study of history. Students encounter the same high standards for accurate, expressive writing and thoughtful reading in their Math and Science classes. Creative writing, journaling, drama, and the arts also play into this class as parts of learning expeditions.*

#### Seventh Grade English

This course focuses strongly on three important skill areas:

- the writing process (learning how to draft, edit and revise),
- the reading process (learning strategies for comprehension, interpretation, making connections, and discussion), and
- the research process (learning how to gather information based on guiding questions, take notes, organize ideas and document sources).

The basics of writing and speaking in clear, grammatical language are also emphasized. Students work through multiple drafts, often writing for audiences beyond the classroom.

#### Eighth Grade English

This course centers on a study of individuality and culture. Students read Lord of the Flies and other novels that explore aspects of human nature and social patterns. Students will also develop grammar and organization skills as they practice narrative, persuasive, and expository writing, where students will create and support their own thesis statement. Students will examine individual development within civilization use structured media as a means of personal expression. Eighth graders will also investigate poetry to identify some devices for figurative writing and to experiment with the transcendent capacity of language. Overall, students will gain skills to be independent and capable students.

### Social Studies

*The approach to learning Social Studies in the Middle School is to develop skills of investigation as historians and social scientists, deepen understanding of social processes, and explore how various cultures have expressed their humanity. Much of the study is done through projects and learning expeditions, integrating with other subjects as much as possible.*

#### Seventh Grade Social Studies

In this course -- World History I -- the historical emphasis in this course is on ancient and classical civilizations of the Mediterranean and the key political, social and religious ideas developed in them that have shaped our current world. There is also study of geography and current events. The skills students will work on include:

- Explaining your Thinking – Back up ideas with specific information.
- Consider Different Perspectives– There’s more than one side to a story.
- Teamwork – Share ideas and responsibilities; communicate with each other.
- Revision –Our work gets better when we use and give good feedback.
- Notebook Organization – Taking and organizing good notes are essential skills.

#### Eighth Grade Social Studies

World History I continues in 8th grade, moving forward from the fall of Rome to the Enlightenment. Throughout this curriculum, eighth graders will investigate the structures that make up a civilization, such as culture, social structures, economy, ecology, government, technology, and religion. The course moves through the Middle Ages, exploring ways in which diverse communities around the world lived and contributed to technological development. Students will also examine the development of visionary thinking during the Renaissance and Scientific Revolution, and they will use this knowledge to explore their own visions for the future of this world.

## Math

Our mathematics curriculum in grades 7 and 8 uses the Connected Mathematics Program (CMP), which is organized around rich mathematical investigations that challenge students to apply math in real-world situations. Our students face rigorous problems that require careful interpretation, detailed calculation, and extensive explanation. In 7<sup>th</sup> grade, students are introduced to algebraic variables and equations by finding their fastest and slowest speed on a bike trip. You might see 8<sup>th</sup> grade students using Pythagorean Theorem to determine the proper slope of a wheelchair ramp or using linear Algebra to analyze the results of science investigations. Math and Science meet in a double-period each day taught by the same teacher, which gives the flexibility to integrate the subjects.

### Seventh Grade Math

The focus in this course is on geometry and algebra basics: proportional thinking focused on ratios and properties of similarity, 3D geometry and angle relationships, and operations with integers, variables and large numbers.

### Eighth Grade Math

In this course, students deepen their understanding of linear algebra through connections to geometry, the Pythagorean Theorem, mathematical modeling, and exponential, quadratic and non-linear relationships. Daily homework assignments require students to apply skills, practice problem-solving and explain their thinking in writing.

## Science

Science at Four Rivers is full of inquiry and activity. Hands-on investigations, labs, and real research are central parts of the curriculum. When possible, science-based learning expeditions relate to the school's themes and focus on Franklin County, giving intensive opportunities for designing and conducting investigations in the field.

### Seventh Grade Science

The focus of this course is on geology, biology and ecology. In the fall, you might find seventh graders examining local rocks as pieces of the past, looking for clues about the dynamic history of the earth here in the Connecticut River Valley. Mid-winter you are just as likely to find students bent over microscopes, as building cell models or designing their own experiments with bread, yeast or mold. In the spring, you may find them knee-deep in water, getting familiar with a local vernal pool. You are just as likely to see them carefully working on detailed watercolor paintings and research in order to compose scientifically accurate web pages about the endangered species in local watersheds.

### Eighth Grade Science

The focus of this course is on astronomy, physics, chemistry and engineering design. Science investigations involve in-depth study of concepts culminating in a final product and presentation. For example, students may apply their knowledge of motion, force and engineering design by building and testing catapults. Or students may apply and extend their knowledge of buoyancy and density by building and exhibiting working models of hot air balloons, submarines, and more. They also explore the nature of science by considering and re-creating the work of scientists like Galileo and Newton. If you find students dropping marbles and bowling balls from the second story porch, then you've found an 8th grade science class at work.

## SPECIAL SUBJECTS, GRADES 7-12

### Spanish

The Middle School offers an introductory level Spanish class 2 days a week in 7<sup>th</sup> grade and 4 days a week in 8<sup>th</sup> grade. Students are expected to read, write, and converse in Spanish, as well as gain some understanding and appreciation of Spanish-speaking cultures, including those within the local community. Students who successfully complete the middle school program will be ready for Spanish 2 when they enter 9<sup>th</sup> grade.

### Wellness

In Wellness classes throughout the Middle and High School programs, students develop fitness, play games, learn skills and teamwork, and gain confidence in their physical abilities. There is an emphasis on students striving for their "personal best." An elective after-school sports program adds the opportunity to play on competitive teams, and the school has strong teams and a full schedule of games in soccer and ultimate Frisbee.

### Four Rivers Sports

Four Rivers Sports is a class to introduce students to the competitive sports program at Four Rivers. Students learn the sport of ultimate Frisbee in the fall and basketball and soccer in the spring. The purpose is to give the students the opportunity to learn the fundamentals of each sport as well as character building, sportsmanship, conditioning, and skillful play so they will feel more confident to play on the school teams if they so choose..

### Art

Students study 2 and 3 dimensional design, composition, methods and materials in drawing, painting, and sculpture, as well as art history and criticism.

### Technology

Technology classes are used to enrich and expand learning throughout the school, especially with various tools for communication.

### Nature

This class heightens students' abilities to observe, understand and be at home in their natural surroundings, and strengthens their attention in other settings.

### Music

Students' study of music includes basic elements of composition through rhythm and voice, as well as appreciation of a wide range of music.

# HIGH SCHOOL

## English

*In the high school, English courses take student writing and analytical skills to more challenging and complex levels. After establishing a strong foundation, students explore the many facets of both creative and expository writing, interweaving the two as fits the assignment. Through analyses of models, the critique process and extensive revisions, learners reflect on themselves as writers and students of literature. These reflections then inform areas of strength and specific needs for improvement.*

### Ninth Grade English

Through 9th grade English, students focus on developing foundational literacy skills that will prepare them for college, the work force and their future. Core skills that will be emphasized in 9th grade include: Academic writing for a college audience; Using quotes to support a thesis; Narrative writing; Analyzing literature—recognizing themes, relating ideas to history and contemporary society; Developing dialogue and interview skills; Carrying out a long-term investigation. Students are challenged to explore truth, perception and reality through literature and current events, make meaning of texts writing in Early Modern English, correctly use MLA style citations in their writing, and complete an I-Search project exploring a topic of their choice. They are asked to answer questions with more questions, rely on each other as a community of learners, and develop an understanding of their own abilities, strengths, and areas for improvement.

#### **Main Texts include:**

To Kill a Mockingbird  
Twelfth Night  
Othello/Taming of the Shrew  
The Secret Life of Bees  
The Killer Angels  
Siddhartha

### Tenth Grade English

10th grade English is divided thematically into thirds. Each section focuses on specific skills, linked by a unifying theme. Through this course students build their literacy skills, moving beyond basic understandings of analysis, research and writing. Students are challenged to reflect on and present their own world views while reading excerpts from Transcendentalist writers, explore the ways science fiction can teach us about society and humanity, and use texts to explore the question: What is worth fighting for? Heavy emphasis is placed on research and academic writing, with a goal of students developing skills and strategies for structuring their work and becoming more independent researchers and writers. Through this course, we also evaluate how literature is shaped by its context, explore social commentary, review grammar and mechanics necessary for good writing, craft varied pieces of writing with attention to tone and audience, and develop presentation skills.

#### **Main Texts include:**

Transcendentalist Essays  
Mountains Beyond Mountains  
Ender's Game  
Short Stories by Ray Bradbury  
The Things They Carried  
The Crucible

### Great Books

(Div 3 Elective) Students in this class examine the literary canon and its role in education. What is the canon, and why does it exist? What do these texts teach us about what it means to be human? To answer these questions, students read texts from four major literary periods: the Renaissance, the Age of Reason, the Romantic and Victorian Era, and the Modern Period. They examine the characteristics of each period and identify those characteristics in their texts. They discuss both the content of each text and the text's role as a "Great Book." Students survey other schools to gather information about the role of the Canon in education today. At the end of the semester, we hold a "Great Books" symposium wherein students conduct round-table discussions to share their opinions on the ideal role of the Great Books in today's schools.

### Modernization: Literature

(Div 3 Elective) Students in this class examine the relationship between technology and community through literature. What is progress? How has our relationship to technology shaped our culture, and what does this mean for our present and our future? They read selective nonfiction about this relationship while studying dystopian fiction: texts that describe utopias gone wrong. They examine the way these texts reveal our fears and our values. Along the way, they propose a tech-free challenge to themselves: how does living without modern conveniences affect our interactions? The results of this experiment are documented and discussed, and students create essays and creative works that articulate their visions for the ideal coexistence of technology and community.

## Social Studies

*Social studies courses are research-based and follow a sequence recommended in the Massachusetts curriculum frameworks. Students learn to approach the world with the sensibility of historians and social scientists. They are active researchers in uncovering and disseminating historical facts, theories and phenomena, increasingly using primary sources to support their own inferences from historical data. An emphasis on public speaking and debate targets the art of communication, enhancing the quality of student presentations and discussion, and providing continuous opportunities for the examination and use of relevant evidence.*

### U.S. History I

This course is a survey of U.S. History from the colonial era through the Civil War. It is organized thematically, with the first trimester focusing on the emergence of democratic systems in America and the evolving nature of Americans' interaction with and shaping of the natural environment. As the year progresses, students devote the second trimester to readings, discussions, and activities centered on the themes of independence, freedom, and human rights. Finally, students explore the rapid growth of the United States in the 19<sup>th</sup> century, focusing their work on examining more closely the paradox of slavery in a nation founded on principles such as freedom and independence. Students develop their understanding of the root causes of the Civil War, with a focus on the impact of regional cultural and economic differences that became more profound as the nation grew in the antebellum years.

### U.S. History II

Tenth grade U.S. History II is a survey course of U.S. History that covers Reconstruction through the 20<sup>th</sup> century, with intermittent investigations into 21<sup>st</sup> century events and issues. It is organized thematically, with the first trimester focusing on the struggle for freedom and civil rights that African Americans and their allies engaged in during the Reconstruction era and in the Civil Rights Movement of the 1950s and 1960s. As the year progresses, students devote the second trimester to readings, discussions, and activities centered on The Great Depression and labor history in the 20<sup>th</sup> and 21<sup>st</sup> centuries in America. Finally, students explore causes and consequences of U.S. involvement in wars of the 20<sup>th</sup> and 21<sup>st</sup> centuries.

### Education Policy in the U.S.

(Div 3 Elective) Students in this course will study public policy, what it is, how it is shaped, and what it is for. The course looks specifically at education and educational choices historically as a way of seeing what different people at different times have tried to impart to the next generation. What really mattered to them? What were they trying to reproduce? This course begins by examining powerful themes in the history of education. We examine the role of education in civic life, struggles for educational equality, and different philosophies of teaching and learning. As the course progresses, we will conduct primary and secondary research in topics of interest to students, using social science methods. Students address the question: what educational policies and practices best support our nation's goals and values? As a final project students will create policy recommendations similar to the documents that we have created at Four Rivers -- related to whatever area they find interesting -- for example discipline, positive culture, fieldwork, or state standards.

### History of Community

(Div 3 Elective) In this course, students examine the way that communities have changed in American history in response to the industrialization and urbanization of the 19th and 20th centuries. We consider 'community' both as a physical thing (town and city organization) and as a social thing (society, family, etc.). We are especially interested in how these two meanings are connected: how does the way we use space express beliefs and values? How does our use of space influence the way people interrelate? To unravel the answers to these questions, we begin by investigating how industrialization and urbanization came about and evaluate their effects. What influence did these changes have on communities? We look at case studies in urban planning to see how communities have been imagined and re-imagined in the modern era partly in response to these conditions. How have people 'talked back' to their social conditions by imagining new communities and new uses of space? Students use urban planning techniques to create design proposals for spaces in the local community.

## Math

*Mathematics instruction in the high school at Four Rivers presents the traditional content of Algebra I, Geometry, Algebra II, and Trigonometry/Pre-Calculus using an integrated, problem-based, four-year curriculum. Students spend 6- 8 weeks on a unit, where they study concepts in depth, from multiple perspectives, and through discovery. More than just memorization and drill, they are courses in mathematical thinking. Students learn both teamwork and independence, and they share and present their work daily.*

### IMP 1

In ninth grade, students focus on problem solving and its application to probability, data analysis, algebraic concepts, and basic geometry and trigonometry. If you visited a ninth grade math class, you might find students doing a lab to derive the formula for the period of a pendulum swing, using similarity to calculate the height of a billboard, or inventing a game based on probability concepts.

### IMP 2

Tenth grade mathematics adds more sophistication and deeper understanding. Students begin to work with more complex algebraic expressions, geometric concepts, and statistical analyses. In a unit called “Cookies” students investigate how to help a small bakery owner make decisions about their business. Tenth graders also conduct their own research projects and analyze their data using sophisticated statistical calculations.

### Advanced Algebra

In this course, we cover a variety of mathematical topics, including quadratic, trigonometric, exponential, and logarithmic functions, as well as topics in geometry and statistics. The first few weeks will consider the path of projectiles and other applications of quadratic functions. Then we will consider exponential functions, analyzing world population growth. We will complete the first semester investigating the odds of the Good Guys winning the pennant, looking at combinations and permutations. While it is not the focus of the course, Advanced Algebra makes a point of touching on topics that will help interested students prepare for the math SAT.

### Calculus

This course covers basic differential and integral calculus and the mathematical foundations for calculus. For the first four weeks, it explores important material from a computationally light perspective. Students study the mathematics of the Fourier series, mathematically describing complex sound waves. After that, students work through the process of designing and implementing best strategies to master basic calculus. The course prepares all students to sit for the AP Calculus Exam in the spring, though sitting for the exam is optional. Topics covered include the two fundamental ideas of calculus, the derivative and the integral, and many pre-calc topics, including limits. In the late spring, the class will create a review book to support future classes or to use as a reference as they move into even higher mathematics.

### Applied Mathematics

Students develop the math skills and learn the content necessary to be money wise. This involves fluency with the numerical language of money. Students develop this fluency first by playing the Stock Market Game (SMG), a game in which student teams maintain sizable portfolios of virtual investments. As part of the SMG, students take on the role of stock brokers and make a power point presentation, describing their portfolios to prospective clients. Once the SMG is underway, students build fluency by reviewing and practicing basic mathematics with a focus on developing comfort with the math of financial transactions, such as credit cards and other debt instruments, payroll deductions, leaving tips, saving and investing, comparing prices, and analyzing nutritional labels. Students also learn techniques and tricks to do certain math in their head. Finally, each student learns how to use a spread sheet and create 3-year financial projections for a business or individual of his or her choice.

## Science

*The science program emphasizes Scientific Inquiry, Science and Society, and the unifying principles of Science. For Inquiry, students work to conduct and design scientific investigations, identifying testable questions, formulating hypotheses, and gathering data. They also learn to analyze and interpret data. Once they've done the analysis, students have to draw conclusions from the data and communicate their findings. Expeditionary learning is all about inquiry, so science learning is truly at the heart of this school. Beyond that, students work to understand science in larger social contexts and as a component of active citizenship. Finally, our science program aims to help students develop strong understanding of fundamental scientific principles.*

### Environmental Science

Ninth grade science at Four Rivers continues the investigations, labs, and hands-on approach to science developed in the 7th and 8th grades. Students study Environmental Science, where they investigate the science behind a variety of ecological issues and environmental topics such as renewable resources, global climate change, ecosystem ecology, succession, and biodiversity. Because students learn science best when they do real, hands-on investigation, this class is based on actual problems requiring genuine research. Students are expected to design their own scientific investigations in the lab and in the field.

### Biology

Tenth grade science focuses on the biological sciences with an emphasis on human health and physiology. Four Rivers biology begins with a solid understanding of chemistry and the molecular basis of life. Cellular biology is studied through the lens of the nervous system, immune system, and cancer. The students look at the diversity of life as they study genetics and the theory of evolution. Throughout the year the students are required to conduct research, present data to their peers as well as community audiences, and create detailed models that illustrate their understanding of scientific concepts. As with the other sciences at Four Rivers, Biology is hands-on and investigation-oriented.

### Chemistry

This course introduces the basic language and concepts of chemistry. Using the periodic table and models, students explore atomic and molecular structure. Students gain insight into chemical reactivity through experimentation, investigating how and why certain chemicals react the way they do; students also develop laboratory skills to understand the importance of accurate measurement and how to analyze the significance of their data. Throughout the year, students discover how chemistry plays an important role in many different professions.

### Food Chemistry

This semester long class explores the science of food, from the field to the grocery store. Topics include the basic chemistry of food production, processing, and additives such as sweeteners and preservatives. Students also explore food's relationship to society, government policy and regulation, and public health.

## Spanish

*Both the Middle School and the High School at Four Rivers offer Spanish as its world language. Students are expected to read, write, and converse in Spanish, as well as gain some understanding and appreciation of Spanish-speaking cultures, including those within the local community. Instruction begins in the 7<sup>th</sup> grade at an introductory level, and continues in the high school with opportunities for more advanced classes. The communicative approach is active, it includes projects and the arts, and it speaks to the different ways -- aural, visual, and kinesthetic -- we learn language. Spanish 1 covers the present, present progressive and preterit tenses, as well as informal commands. Spanish 2 explores the past tense further by introducing the imperfect and present perfect tenses. In addition, students learn formal commands, the future and conditional tenses, and are introduced to the subjunctive mood in Spanish. Spanish 3 reviews much of the grammar from previous years, and exposes students to the finer details of both the indicative and subjunctive moods. Students in their third year also spend more time reading and writing about authentic literary works in Spanish, as well as improving conversational skills through class discussion. Spanish 4 is an advanced level course that reviews much of the material from Spanish 1, 2, and 3. Students broaden their previous knowledge and develop a more authentic grasp of the language by investigating the finer points of certain grammatical concepts.*

### Spanish 1

Spanish 1 is a beginning level course that introduces students to the basics of

### Spanish 2

Spanish 2 is an intermediate level course that expands on the grammar points from

### Spanish 3

Spanish 3 is an advanced level course through which students broaden their

### Advanced Spanish

Conversing in Spanish is the focal point of our class time together with emphasis on

Spanish grammar and vocabulary. Major vocabulary themes in the first year include physical descriptions, family, sports, food/restaurants, weather, and parts of the home. Students learn how to communicate using the present tense, informal commands, and the preterit tense. Although the class works with multiple modes of communication, many of the assessments have a strong oral component. Students also explore the cultures of a variety of Spanish speaking areas focusing mainly on Spain, Mexico, Puerto Rico and major cities within the United States. There are numerous opportunities to link the curriculum to other subject areas. This class hopes to motivate students to learn Spanish by helping them to achieve early success.

the first year. Major vocabulary themes in the second year include travel, art, life in a city, health issues, the environment, and hobbies and professions. Students learn how to communicate using the imperfect tense, formal commands, the future, and the conditional tense. The class begins to study the subjunctive mood and how to express emotions, hopes, and doubt in Spanish. Students explore the cultures of Spain, Mexico, Puerto Rico, Costa Rica, and major cities within the United States.

previous knowledge and develop a more authentic grasp of the language by investigating the finer points of certain grammatical concepts. Major vocabulary themes in the third year include nature and the environment, historic events and holidays, college and professional careers, and music, art and film. Students develop their writing and conversational skills by employing a variety of verb tenses in both the indicative and the subjunctive moods. They strengthen their reading skills by analyzing literature. Students explore the cultures of Mexico, Central America, the Caribbean, Spain and South America. The ultimate goal of this third level course is to help students establish proficiency in communicating in Spanish, as well as deep understanding of the cultures where Spanish is spoken.

vocabulary development, colloquial idiomatic expressions, and accurate grammatical expression. Students experience language in memorable ways to help advance their language proficiency. Students study authentic examples of Spanish and Latin American literature and develop strategies for becoming a more fluent and independent reader. An overarching goal for this course is that students gain confidence in using the language to communicate complex ideas and feel inspired to continue studying Spanish in the future.

## Division 3 Special Programs

### Senior Expedition

A successful Senior Expedition is a graduation requirement, but more importantly, it is an opportunity for students to demonstrate their highest level of learning at Four Rivers. Students choose a topic that interests them, they develop guiding questions around it, they learn all about the topic and become an *expert* on it, they do something with the knowledge gained, and they give a presentation to the community on what they have learned, how they learned it and what they did with their knowledge. Senior Expedition is a time-intensive, demanding project requiring a level of commitment beyond that of any other academic endeavor at Four Rivers.

### Junior Internship

The Junior Internship is a key part of the final division of the school. The internship happens outside the school in the community, with students finding a mentor in a professional setting connected to their interests. Students spend a week – sometimes more – in the work place with their mentors \*and then create a display that documents their internship experience. The Junior Internship Project is a step toward preparing for the Senior Expedition.

### Independent Studies

One option in Division III (11<sup>th</sup>/12<sup>th</sup> Grade) is to conduct an independent study for credit. Students in Division III may create independent studies that are standards-based and meet course requirements of Four Rivers. Independent studies must follow the format and criteria described in the Independent Study Contract, to be approved by the Principal.

### Learning through Work/Service

Students may also earn elective credit for internships or other work outside of school that is related to academic subject matter. For example, a student might volunteer as an assistant in a pre-school, have an internship in a machine shop, or work as a volunteer in the local fire department. Experiences that stretch both a student's knowledge and skills are considered credit worthy. Students who wish to earn credit through work or service must complete an Internship Contract, to be approved by the Principal.