

Science



Murray's science curriculum contains both laboratory and classroom projects and web based reading and research assignments. This meets the state standard for scientific inquiry in an experiential setting with strong emphasis on the content and process of science. This is done in a cooperative learning environment using best practices.

Murray's **Accelerated Science Program** is an integrated two year course of science exploration in the fields of physical science, earth science, astronomy, chemistry, and life sciences. A sixth grade component added in 2013-14 prepares students for this course. The

curriculum revolves around the basic premise that energy causes changes in matter. A student who completes the program successfully meets the State of Minnesota's Academic Science Standards for sixth, seventh, eighth and the ninth grade science, thus allowing the student to enter Pre-AP or Pre-IB class offered in the science pathways of the St. Paul High Schools.

During 7th and 8th grade, a science fair project must be presented by the student at Murray's science fair. Students who complete the accelerated coursework enter ninth grade ready to take high school biology.

6th Grade Science

Sixth grade is a year to lay down the foundations of science for the rest of middle school. The subject matter of the curriculum begins the first semester with an exploration of the metric system, laboratory safety, engineering processes, motion and forces. The second semester students are also introduced to the physics of motion, forms of energy, principles of work and heat, and waves such as sound and light. Scientific Method is also explored throughout the year. This involves determining a testable question, making a hypothesis, designing a scientific investigation with appropriate controls, analyzing data distinguishing between qualitative and quantitative data and making conclusions.

7th grade Accelerated Science

In addition to many of the seventh grade standards students explore the ninth grade standards such as the physics of motion, forms of energy, principles of work and heat, and other energy issues. They study the dynamics forces in earth's atmosphere and hydrosphere. The next unit studies the dynamic forces of the earth including the earth's structure, the formation of the different types of the earth's rocks, and the changes in the earth's crust that created them. This section includes plate tectonics, the effect of plate tectonics on the world's continents, oceans, and the processes of geology and its effects on earth's history. Included is a study of the human impact on the environment. The last unit includes a section on the physics of waves, light and sound, fulfilling the ninth grade standard for the study energy transformations.



8th Grade Accelerated Science

The curriculum begins with a study of the sun as the principal energy source of the solar system and the sun's effect on the moon and the earth. The class compares and contrasts the planets, and explores what is established and what is currently being discovered about the billions of galaxies in our universe. Included is a unit on scientific inquiry that enables the students to design and complete a scientific experiment using scientific methods.

Students then study the structure of matter which includes the parts of an atom: protons, neutrons and electrons; and the periodic table. They compare and contrast the properties of elements. A segment on the bonding of atoms into compounds and the interactions between particles prepares students for the next unit, chemical reactions.

The final unit focuses on biology which explores the cell as the fundamental unit of life. It begins with single-cellular organisms and advances to multi-cell plants and animals. Students learn to distinguish between plants and animals at the cellular level. Their study of these living organisms ranges from how organisms convert food to energy to the chemistry of life. The students then explore the diversity of organisms and heredity. The last unit covers the flow of matter and energy, with an introduction of open and closed systems and their effect on energy transformation.

7th grade Life Science

This is an introductory biological course that uses hands-on activities, models, computer technology and inquiry labs. The curriculum covers basic scientific skills (scientific methods, measurement, and laboratory safety), cell biology and an introduction to genetics. Students explore the form and function of the kingdoms of life. They learn how the kingdoms are defined, how they meet the needs of life, how they are diversified and how individual organisms behave. The unit on the human body examines specialized cells within the body, body systems and interactions with disease. The year includes a section on ecology, which examines how living things interact with each other and their environment. This is a full year course which meets all the seventh grade state science standards.

8th grade Earth Science

This curriculum presents basic earth science concepts about the earth's structure and its processes. This involves the study of the types of earth's rocks and the changes in the earth's crust that created them. It introduces the study of geology and how geology has affected the earth's history. Second semester introduces meteorology where students learn about the water cycle, weather, and climate to better understand how air, water, and heat interact to create weather. Students also study astronomy, our solar system and other galaxies. They learn how the sun and moon affect our planet.

Students also review basic science skills which includes the nature and history of science. Students go on a number of field trips during their science coursework. These include trips to Minnehaha Park, Lillydale Park, and the University of Minnesota. Students who complete the Life Science and Earth Science courses are well prepared to enter ninth grade Physical Science.

Science Fair—Middle School Fair



Murray's **Science Fair** is a 2-day event that originated in the late 1980's in which judges evaluate science papers and science projects. The project judging has grown to become one of the longest lasting science fairs in Minnesota.

Students choose their topic from among 13 categories with the assistance of teachers, parents or mentors. Once selected, they complete an experimental design, collect data and create a presentation board. Staff and students from the University of Minnesota mentor students as they research and run experiments on their chosen topic.

The student's work culminates with a presentation of their paper or project to three judges. There are over 100 judges for the projects. This pool of judges is made up of adults from Twin Cities' universities and colleges, parents, alumnae and the business community. Out of over 300 student participants, approximately 10 percent are selected to pursue the next level of competition at the Twin Cities Regional Science Fair. Many of these students further advance to State Science Fair hosted by the Minnesota Academy of Science. Some of our Murray students have even been chosen to compete at the International Science and Engineering Fair, Broadcom Masters and the Discovery Young Scientists Competition.

Mathematics

All of Murray's mathematics courses help students understand the connections between the various strands of mathematics and the connections math has with other areas of study. The Murray mathematics department is diligent in placing a student in a math class that is educationally appropriate for the student. Our counselors use the student's MCA test scores and the grade school teacher's recommendation, in consultation with the parents/guardians, to determine which level is suitable for an incoming 6th grader.

Sixth Grade Mathematics will follow the curriculum adopted by the district. Students who have participated in an accelerated program will be placed in an appropriate course based on tests and recommendation of their elementary school teacher.

Pre-Algebra courses prepare students for Algebra. The mathematics strands covered in this course are: numbers and operations; algebra; geometry; and data analysis and probability. Students also study the foundations of geometry- perimeter; area and volume; data and statistics; probability and multi-step equations; and inequalities. Students successfully completing the accelerated Pre-Algebra class will be prepared to meet the entrance requirements of the accelerated Algebra course.

Algebra emphasizes connections to the real world as well as connections to the different strands of math. Algebraic skills and applications are interwoven throughout the course. Functions and their various representations form the context for much of the curriculum. Algebra emphasizes critical thinking and reasoning, focusing on proportional reasoning, and the application of arithmetic in more abstract ways. Murray offers both accelerated and regular algebra.

Murray's Advanced Mathematics Program begins with the accelerated algebra course offered to eligible sixth and seventh grade students. Students entering accelerated Algebra generally demonstrate high standardized test scores and an above average overall math aptitude. For students who successfully complete accelerated Algebra in their grade, Geometry is the next class in 8th grade. Both accelerated Algebra and Geometry are considered high school courses and receive high school credit.

Geometry: This is an introductory course in plane geometry whose goal is to increase student's mathematical maturity and reasoning skills. Topics include elementary logical reasoning, properties of geometric figures, congruence, similarity, and right triangle relationships using trigonometric properties. Formal proof is introduced and used within the course. It is a complete high school geometry course and successful completion prepares students for Algebra II in 9th grade.

University of Minnesota Talented Youth Math Project: In addition, Murray students have the opportunity to participate in **UMTYMP**. These students attend math class once a week at the University of Minnesota and are exempt from Murray math. Participation in this program is based on successfully completing a qualifying exam in 5th grade through their elementary school or in sixth grade.

APEX Online Algebra II: Through a "Discovery-Confirmation-Practice-" based exploration of intermediate algebra concepts, students are challenged to work toward mastery of computational skills, to deepen their understanding of key ideas and solution strategies, and to extend their knowledge in a variety of problem-solving applications.

English

At Murray all students take two semesters of English each year. The core curriculum state standards are embedded within these courses. Accelerated classes are for students who have a talent or strength in this subject, or who want more rigor and can work well independently. Accelerated classes will be faster-paced and feature more in-depth coverage of the content and required materials. The same standards are covered in both levels of English.

English 6 follows the curriculum adopted by the district, which includes Readers' and Writers' Workshop strategies such as: mini lessons with read-alouds, independent reading time, book clubs, individual and small group work, news articles (with vocabulary), short story analysis, Socratic discussion seminars and keeping a writer's notebook. In the notebook students discuss, and respond in writing to a variety of literature across genres. This notebook is to remain in class. Notebooks will also act as a gathering place not only for entries about various topics, but also to store items/artifacts that are worth writing about (pictures, tickets, articles, etc...). Students will take the best ideas from their writer's notebook and using the writing process, rework them in several drafts for their final published works.

First semester also incorporates study skills where students learn "active" study strategies and management skills including how to use Cornell Notes in class work. Learning how to be organized will help them succeed in an academic environment. This unit utilizes the Murray school planner and other professional sources.

English 7 (regular or accelerated) is run in a workshop format utilizing readers' and writers' strategies such as group work and projects, and combines all of the standards applicable to ELA 7: writing, reading, speaking & listening, and language. Students do extensive analysis of literature and informational texts practicing identification of themes, character, setting, conflict and plot with evidence to support their analysis. They write formal memoir, informative, and narrative pieces focusing on use of the writing process to improve final pieces and strong descriptive language. The connection between the texts and the writing are the thread that weaves it all together requiring students to be both author and audience. Short research projects, figurative language, and media literacy units are also embedded in the course.

English 8 (regular or accelerated) During the year students read and discuss several texts focusing on nonfiction. Students read, analyze, and ultimately write their own formal nonfiction piece. Students also focus on two Holocaust texts: *Maus* and *Night*. They study point of view and persuasive techniques as they read and discuss editorials and other persuasive texts. Then they write their own persuasive essays and participate in formal debates.

Other texts students might study during the year include *A Midsummer Night's Dream*, *The Pearl*, *Flowers for Algernon*, and *A Raisin in the Sun*. Writing assignments will ask students to think about reading selections and to back up assertions with evidence from the text. Independent writing assignments are also given to allow students to write in the genres of their choice. Vocabulary and sentence structure are studied throughout the year.



Reading Strategies is available to students needing support with vocabulary and comprehension.

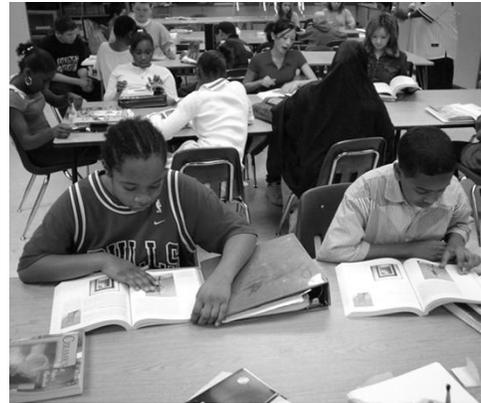
The course evaluates the student's reading level and focuses on developing necessary skills using appropriate instruction: individual computer work, silent reading, vocabulary and testing strategies. This rotational work is paired with writing instruction to fulfill the English standards.

English Electives

Murray offers many English elective courses. Students are encouraged to take an English elective each year to strengthen their writing, reading and communication skills in a wide variety of formats. These courses are open to all grades unless noted.

Creative Writing provides an opportunity for students to develop their writing skills, to examine published pieces of creative writing, and to familiarize themselves with the creative process by writing poems, stories, scenes, pieces of realistic fiction and chapter books.

Mythology is offered to students interested in exploring the genre of myth. Students read mythical stories from various cultures as well as write, draw and tell one of their own. Greek, Chinese, Norwegian, African, Japanese, Irish and many other myths are read and discussed in the course.



Journalism includes writing and editing a student newsletter, doing live morning announcements via P.A. and television, producing videos, and keeping a portfolio. In addition, students maintain a journal, work with technology and analyze weekly news articles. This course is an **8th grade elective**.

Graphic Novels will incorporate fiction and non-fiction graphic novels to teach communication, analysis of literature and creating original works.

Social Studies

Six graders study **Minnesota History and Geography**, seventh grade students take up **American History** where they left off in 5th grade and 8th grade students study **Global Studies**. Accelerated levels are offered for both the 7th and 8th grade curriculums. Students come to better understand the current status of the world by studying the historical perspective of Minnesota, the United States and the physical and cultural make-up of the world. As part of the social studies curriculum, students participate in the National Geographic Geography Bee and the National History Day Fair.

Minnesota Studies is a course focused on the geography, history and cultural studies of our state's legacy and people. Students learn the many cultural groups that make up our population, the key events and people of Minnesota's history, and understand Minnesota's key contributions to our national and world history.

The year will begin with the geography of the first Minnesotans, Dakota, and Ojibwe. Then students study Minnesota land treaties between the Dakota, Ojibwe and the federal government and statehood. They also begin topic exploration for History Day and begin their project research. Students complete their History Day research and project in third quarter. In the final quarter we explore Minnesota's contributions to the 20th century.

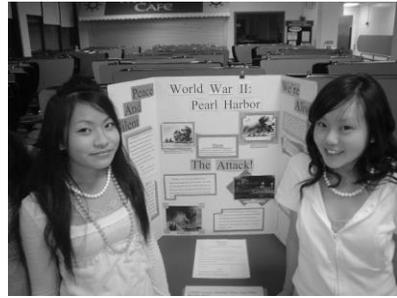
American History involves the study of the social, political, and economic development of the United States from the American Civil War through the present day. The content allows the students to understand historical events and the roles of individuals within them. The four-quarter course is divided into four sections. In the first quarter the focus is on the Civil War. **Second quarter covers** the Post Civil War and westward expansion. The third quarter covers the area of World War I through World War II and the major project for this unit is the History Day project. **The final quarter concentrates on Post World War II up to modern day.**

Global Studies is designed to help students understand how events or actions of people are influenced by physical and cultural geography. This course involves the study of the five universal themes of geography including human/environmental interactions, location, movement, place, and regions. Students identify current issues that involve a particular region, or variety of regions. They make and read maps and graphs; collect and analyze data, and participate in group decision making.

The major focus of this course and applications is to analyze and interpret the causes and effects of the ever-changing distribution and migration of human populations on the earth's surface. They compare and contrast how physical and cultural geography has influenced and will continue to influence regional and world issues of the past, present and future. The students use the five basic themes of geography to examine a current event or issue, to interpret and convey the interdependence of world peoples to one another and to their environments through charts, maps, timelines and graphs; to understand the relationship between place, religion, culture, ethnicity and race; to identify how the physical environment is modified by and modifies human activities and to develop a mental map of Minnesota and the world.

History Day

A History Day project is a required project for students in 6th and 7th grades. Students work individually or in teams in one of five categories: exhibit, documentary, performance, website or paper. They conduct their research using primary and secondary sources. Then they analyze and interpret their sources and draw conclusions relating it to the broad theme and the historical context and significance.



The National History Committee selects the yearly theme and students pick a topic that addresses that theme from any time period related to local, national or world history. The National History Day is a process which gives students an opportunity to improve their understanding of history by studying historical issues, people, events and ideas through historical research. History Day is supported by the Minnesota Historical Society. Murray teachers encourage students to become historians themselves and to work with resources in their classroom lessons.



Within each classroom, the teacher and students act as initial judges of each project and choose the best to advance to the school History Day fair. Murray's showcase highlights our History Day Projects. Many of our students advance to the regional, state and even national competitions. Murray has sent competitive students to the National History Day for the past four years.

Murray teachers were honored to receive Teachers of Merit awards at the State History Day Competition in 2009. National History Day in

Minnesota chose Murray because of their work embedding History Day in the curriculum.

Model United Nations

Eighth grade geography student participate in this competition each spring. They research a country and then represent that country at the Twin Cities Middle School Model United Nations. In 2011, Murray was honored for its participation and Mr. Hughes received the Model UN teacher of the Year Award for 2011.

Geography Bee

Murray students have the option of competing in the school's Geography Bee. We hold our school-level contest following the eligibility rules and procedures prepared by the National Geographic Society. Students are asked questions that test not only their knowledge of US geography, but also of the world. The school winner takes the written qualifying test which is then sent to the national committee.

The top 100 students selected based on their test scores qualify to represent their schools and compete at the state level. We are notified in early spring if our school Bee winner qualified to represent Murray at the state level. This is an entertaining and challenging test of geographic knowledge.

World Language

Murray offers one World Language—**Spanish**. Spanish will prepare students for Level II High School. Students should begin their language in 7th grade and continue all through 8th grade. This earns them a High School Level I credit and they can move right in to High School level II in 9th grade. 8th graders are welcome to take the class in order to get a jump start on level I in high school, but would not earn the full credit in just one year. Starting in 7th grade is recommended. Classes include many interesting and culturally informative activities, which along with grammar acquisition, build world language skills. By starting in middle school students can get through level 5 in high school. They may even take advantage of college level language courses in their junior and senior years of high school. They may enable them to test out of language requirements or earn free credit for college.

Spanish

In Spanish students use a great text with lots of interactive work that gives them abundant oral and written practice in the World Languages. Students are introduced to the culture of Spanish-speaking countries and learn greetings, basic terms and numbers, holidays, locations and food. During the course of the year, students will be placed in cooperative pairs and groups where they learn to ask and reply using an ever growing vocabulary. These groups allow students to work closely with others in their team. Students in World Language are required to keep up to date with all homework as a way to stay current with the increasing vocabulary and written class work. All assignments, tests and due dates are recorded in the student's planner.

Enrichment Opportunities

1. Spanish students have the opportunity to attend World Language days at the Minnesota Zoological Gardens. This is a time when high school students present in the foreign language all the different animals to the middle school students. A unique immersion opportunity.
2. Students may choose to attend the Concordia Language Camp in Bemidji, Minnesota. At the camp students have a three-day immersion experience in a lovely natural setting.

English Language Learners

The Murray Middle School Multi-Lingual Learner (MLL) department provides services for English Language Learners at varying proficiency levels throughout the school. Our program includes a Language Academy, as well as co-taught classes and English Language Development courses designed to support English Learners that have transitioned to mainstream instruction.



Murray has been a Language Academy site since 2013. The Language Academy program offers intensive English language instruction and provides sheltered classes in the four core subjects: language arts, science, social studies and math. These classes feature a curriculum that focuses on strengthening the reading, writing, listening, and speaking proficiencies of students. Highlights of the EL curriculum include: intensive vocabulary building, research skill development, essay organization and writing, study skills practice, test preparation, and reading high-quality, high interest literature. Students are assigned to Level 1 or Level 2 classes, based on their English proficiency levels, and also participate in mainstream elective classes.

EL students who are at a more advanced level of proficiency receive support through team teaching in the mainstream classroom. This allows for small group literacy and language instruction, as well as modifications and interventions that support equity and educational success for EL students. In addition, an English Language Development class is offered for mainstreamed students. This class offers intensive support in all four language domains (reading, listening, speaking, and writing), while focusing specifically on increasing academic and content-related vocabulary.

MLL courses are aligned with the SPPS MN State Standards and the WIDA EL Standards. Throughout the year, students are engaged in both fiction and non-fiction reading and writing activities. The reading and writing strategies taught in this curriculum are vital for success on the Minnesota Comprehensive Assessments (MCAs) and EL State ACCESS tests in the Spring.



Music

Elective Music courses are available at Murray for both beginning and advanced students. The program strives to help students increase proficiency in their instrument and develop an appreciation for quality musical performance. Students build on their ability to work effectively in class and during home practice. Performances for parents and students are given throughout the year. Music students also participate at Murray's fundraiser at Barnes & Noble.

Orchestra

Beginning Strings is for students with little or no previous experience playing a violin, viola, cello or bass. Students study note reading and learn to perform common folk songs from all over the world. These students will complete level one of a method book during the school year. This course prepares students for Orchestra.



Orchestra is open to students with two or more years of playing experience or who have completed a level one method book. Students learn skills, concepts and attitudes that enable them to develop as individual players and as members of an orchestra. String methods will be employed as well as string orchestra music. Concerts are typically scheduled in December and May. The orchestra has opened the Christmas Carol at the Guthrie Theater and has toured and performed in Saint Louis, Chicago, and Colorado.

Band

Beginning Band is for students who have an interest in playing a woodwind, brass or percussion instrument and have had less than one-year of experience, or have never played a band instrument. Though a basic curriculum, it is aggressive and moves fast to prepare the student's playing level for next year's Varsity band.

Varsity Band is an intermediate level group of students who have played two years or more and have completed a level one method book or successfully completed the beginning band course offered at Murray. Students perform and complete etudes and exercises in the text book *50 original Exercises and Standard of Excellence*. They must exhibit superior etiquette skills during rehearsals. Students perform a variety of concerts at school and within the Murray Community.

Concert Band is for 7th and 8th grade students who have qualified by completing Varsity Band curriculum. Incoming students may bypass the Intermediate level band by contacting the director to schedule a playing audition.

The students learn a wide variety of music and perform in various venues to help market Murray Middle School. The band has opened the Christmas Carol at the Guthrie Theater and has toured and performed in Saint Louis, Chicago, and Colorado.



Physical Education

Murray's **Physical Education** classes offer a variety of sports and fitness experiences, which fulfill the National Physical Education requirements.

Students learn to enjoy physical activity as they increase their awareness of the positive benefits of an active lifestyle. Students learn decision-making and gain skills through selected sport's activities.



Murray's physical education facilities include the gym, Murray Field (next to Health Partners and Highway 280), and College Park.

Health

All 8th graders must fulfill the state requirement by taking one semester of Health. The **Health** course covers topics such as mental health, fitness, nutrition, tobacco, alcohol, drugs, consumer health and human sexuality. Students learn multiple life skills that will help them to: make healthful decisions, use refusal skills, assess information they see online and from their peers, analyze what influences them, set goals for their health, use proper communication and conflict-resolution skills, and be a health advocate.

Teen Issues Elective-

Teen Issues is an 7th and 8th grade elective class. Topics will include: families, self-esteem, peer pressure, bullying, cutting and suicide, teen pregnancy, LGBTQ and school violence. Students will spend time researching these topics, analyzing the influences involved, share thoughts through class discussion and document personal reflection through assignments and projects.

Art

Visual Arts Exploration 6-8

Generally laboratory in nature, Art I expresses and gives experience in a two-dimensional format, i.e. drawing, painting, printmaking.

Ceramics and Sculpture Exploration

Generally laboratory in nature, Art I explores and gives experience in a two-dimensional format, i.e. drawing, painting, printmaking. Tutorial in two and three-dimensional work, such as sculpture, clay and textiles may be offered. This course integrates art history and aesthetic criticism throughout the entire curriculum.

Media Art 6-8

This is a beginning level course in media arts that will use technology such as recording devices, computers, iPads, cameras and software to create original art. This course introduces students to media arts history, analyzes different types of media art, and gives students a hands on experience in video creation, basic cartooning and animation through existence use of computer technology and I-Pads.