

Dayton Regional STEM School

Middle School
Grades 6-8

Course Descriptions
2023-2024



THE REAL WORLD STARTS HERE

The Dayton Regional STEM School

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Our Mission

The mission of the Dayton Regional STEM School is to prepare and inspire the next generation of leaders and innovators.

Our Vision

We will create an innovative learning community whose members are prepared to lead and serve.

Project Based Learning

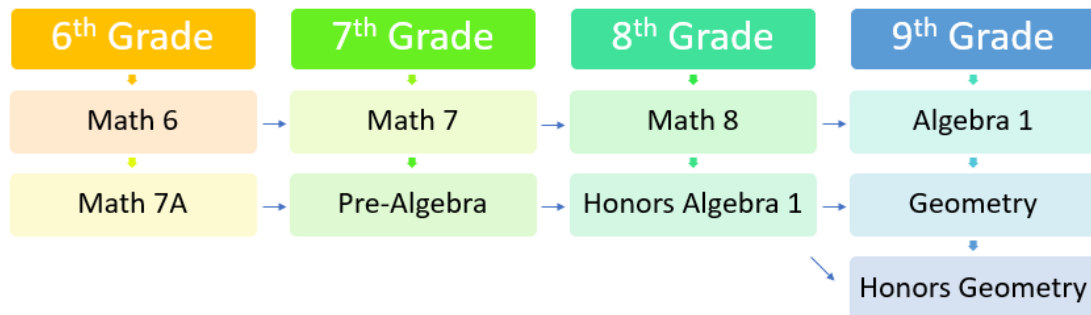
At DRSS, we focus on using Project Based Learning in our curriculum. This teaching practice involves students learning through projects that address real-world problems and challenges. Throughout their education at DRSS, students will routinely learn the content through the process of completing projects. We rely on our large group of local partners to assist in providing authentic problems to allow our students the opportunity to give back to the community.

Five Qualities

In addition to our regular instruction, we teach, practice, model and assess the following “five important qualities” at the Dayton Regional STEM School:

**PERSISTENCE – INQUIRY – COMMUNICATION –
CREATIVITY—COLLABORATION**

Math Course Options



Honors Course Eligibility in Middle School

Students enrolling in the Honors section of a course will go through an approval process before being scheduled into Honors courses. Students must meet the following criteria to qualify for Honors courses:

Honors/Accelerated Math:

- Student is required to have passed math the previous school year
- Student's enrollment in accelerated/honors course must be approved by previous math teacher

Grading System

Report cards will be distributed quarterly. Course credit is assigned upon completion of the course. Credit will not be awarded for courses marked as "Incomplete" or Failed.

DRSS Grading Scale

- A 89.5% or higher
- B 79.5% to 89.4%
- C 69.5% to 79.4%
- F 0 – 69.4%

The DRSS grading scale will be: A, B, C, or F. "I" (In Progress) designation will only be used on a case-by-case basis. Please see an administrator for the information on the grade appeal process.

6th Grade Courses – Year Long

Language Arts 6

Language Arts 6 is an integrated course that incorporates all of the following standards: language development, reading informational texts, reading literature, speaking and listening, and writing. These components are practiced through a series of thematic units centered on realistic fiction/personal narrative, science-fiction, historical fiction, and fantasy novels. While exploring these different genres, students will be exposed to a variety of writing styles. Students will explore the writing process by creating meaningful writing pieces such as a personal narrative, an argumentative essay, an informational piece, and a fictional essay. Speaking and listening skills will be developed throughout each unit by practicing open class discussions, small group collaboration, and class presentations.

Math 6

Desmos is the curriculum used for students in Math 6. This middle school mathematics curriculum is rich in connections among core ideas of mathematics, between subjects, among activities and interests of students, and between mathematics and its connections outside of the classroom. The units for 6th grade include Area and Surface Area, Ratios, Unit Rate and Percentages, Diving Fractions, Decimal Arithmetic, Expressions and Equations, Positive and Negative Numbers, and Describing Data.

Math 7A

Desmos is the curriculum used for students in Math 7A (The accelerated math course for 6th grade). This middle school mathematics curriculum is rich in connections among core ideas of mathematics, between subjects, among activities and interests of students, and between mathematics and its connections outside of the classroom. The units for 7th grade include Scale Drawings, Proportional Relationships, Measuring Circles, Percentages, Operations with Positive and Negative Numbers, Expressions/Equations and Inequalities, Angles/Triangles and Prisms, and Probability Sampling.

Science 6

The middle school science curriculum at DRSS is called IQWST (**I**nvestigating and **Q**uestioning our **W**orld through **S**cience and **T**echnology--pronounced I-quest). In 6th grade science, the sequence of physics, earth science, biology and chemistry instruction builds upon students' prior knowledge and experiences in the real world, and builds understanding from unit to unit both within and across the middle school years. Students learn complex scientific ideas by engaging in practices that include working with models, constructing scientific explanations, engaging in argumentation and debate, analyzing data gathered either from students' own investigations or captured within complex datasets, and presenting ideas to peers. Science content learned through this course will include the interaction of light and matter, the particle nature of matter, organisms and ecosystems, and the water and rock cycles.

Social Studies 6

In sixth grade social studies, students will learn about the ancient river valley civilizations of Ancient Egypt, Ancient China, Mesopotamia, and the Indus Valley. Thematic units about different types of governments, economies, and religions are a few of the major topics discussed. Students will work collaboratively to discover what lessons these ancient civilizations have taught our modern societies, and how ancient civilizations still impact our world today. In social studies 6, students will research new information and help share that information with their peers. Units on mapmaking, timelines, and other basic geographical and historical skills will be learned throughout the year.

STEM Explorations 6

STEM Explorations 6 STEM Explorations 6 will provide middle school students with problem solving skills using the Design Thinking. As part of an introduction to the IT pathway, students will gain foundational knowledge of current HTML and CSS web design standards. They will apply this knowledge to plan, design and develop their Dayton Regional STEM School portfolio using valid, well-formed, scalable and semantically correct HTML and CSS. During the creation process, students will identify and apply the elements of design: balance, rule of thirds, emphasis, padding, color, and line. As part of an introduction to the Engineering Pathway we will utilize the Design Thinking Process through various projects (i.e. Rube Goldberg machines and 3D design.). Through the above pathways, students will also learn and implement 21st Century Skills (ISTE Standards), such as effective communication, collaboration, project management, time management and computational thinking.

Principles of STEM

This course helps sixth grade students transition to our new school and serves to expose students to a variety of experiences they will have during their time at the Dayton Regional STEM School. Students explore topics including computational thinking through Lego robotics, health and wellness including social emotional topics, setting SMART goals, and decision making, followed by sustainability and climate change, and an introduction to advanced manufacturing and photonics. Ongoing reflections allow students to better understand how our 5 qualities are a part of the learning process here at STEM.

7th Grade Courses – Year Long

Language Arts 7

In this course, students will explore reading and writing through a workshop style classroom. Students will be exposed to various styles and genres of writing, and will take individual and group writing pieces through the complete writing process. Theme based novels and informational texts will be used in small group settings for students to learn and practice communication, cooperation, and collaboration. Literature circles will be used to study the genres of fantasy/dystopian fiction and historical fiction. Reading and writing assignments will be supported by mini-lessons and class discussion to enhance student learning and comprehension. Projects and activities in the class are designed to push students to be stronger and more confident advocates, collaborators and communicators in preparation for their future endeavors.

Math 7

This course uses the Desmos curriculum series as the primary curriculum. Desmos provides a wonderful opportunity for students to have an interactive role in every lesson, while teachers are able to view progress and provide feedback in real time. Students are often expected to work in cooperative groups, in which discussion and discovery are encouraged. Major unit concepts include proportional relationships, area and circumference of circles, operations with positive and negative numbers, expressions, equations and inequalities, angles, triangles and prisms, and probability and sampling.

Pre-Algebra

This course uses the Desmos Math 8 series as the primary curriculum. Desmos provides a wonderful opportunity for students to have an interactive role in every lesson, while teachers are able to view progress and provide feedback in real time. Students are often expected to work in cooperative groups, in which discussion and discovery are encouraged. Major unit concepts include coordinate geometry (transformations), proportional and linear relationships, bivariate data analysis, functions, volume, exponents, roots, and Pythagorean Theorem.

Science 7

The middle school science curriculum at DRSS is called IQWST (Investigating and Questioning our World through Science and Technology--pronounced I-quest). In 7th grade science, the sequence of chemistry, physics, and earth science instruction builds upon students' prior knowledge and experiences in the real world, and builds understanding from unit to unit both within and across the middle school years. Students learn complex scientific ideas by engaging in practices that include working with models, constructing scientific explanations, engaging in argumentation and debate, analyzing data gathered either from students' own investigations or captured within complex datasets, and presenting ideas to peers. Science content learned through this course includes chemical reactions, energy transformations, and weather and seasons.

Digital Explorations 7

Digital Explorations 7 will expand upon STEM Explorations 6. Students will delve deeper into the IT pathway by honing their HTML5 web design skills and incorporating current CSS best practices in order to practice planning, designing, and developing their Dayton Regional STEM School portfolio. Students will also continue to use valid, well-formed, scalable and semantically correct HTML5/CSS. During the creation process, students will identify and apply the elements of design: balance, rule of thirds, emphasis, padding, color, and line. Through the IT pathway students will continue to build upon 21st Century Skills (ISTE Standards), such as effective communication, collaboration, Growth Mindset, project management, time management and so forth.

World History 7

This course will look at world history from the period of the Ancient Greek and Roman Empires to the time period of trade and exploration in the 1500's. The course will be broken into thematic units: Ancient Greece/Rome, Middle Ages, Renaissance, Reformation of the church, and Trade and Exploration. In these units we will look at the impacts of the Greeks, Romans, and Renaissance achievements by making connections to our lives today. Through these units, we will analyze how impacts of Greek, Roman, and Renaissance achievements have affected the rest of the world. Students will make class connections to understand how these achievements later get shared through the European trade and exploration time period to the western world. Students will engage in learning through research driven projects, discussions, primary and secondary source analysis, and hands on activities.

Middle School Wellness and Fitness

Semester Course

Middle School Wellness & Fitness is designed to motivate students to build healthy lifestyles for today and the future in all aspects of health-physical, mental/emotional, and social. The curriculum is designed to increase student knowledge & skills in a variety of adolescent health topics in order to achieve and maintain wellness. Topics to be addressed in 7th grade include effective communication, conflict resolution, refusal skills, stress management and advocating for the health of others. In addition, students will regularly participate in physical activity to enhance their teamwork & problem-solving skills. During this course, students will demonstrate an improvement in their cardiovascular endurance and muscular endurance through individual fitness activities, as well.

Engineering Exploration

Semester course

Throughout the semester, students will plan and implement engineering solutions through the process of: design and build a solution, evaluate and determine effective design features within a design, redesign a solution, and explain reasons for design decisions. Students will acquire knowledge and skills in problem solving, teamwork, and innovation as they explore engineering fields. These skills will be introduced and practiced throughout the course.

The following courses have their content split and integrated into the classes listed above, and are not taught as their own individual course.

Web Design

In this course students will create a website with tag text elements, special characters, lines, graphics, hypertext links, and graphical tables.

Pre-Engineering

Students in this pre-engineering course will acquire the knowledge and skills in problem solving, teamwork and innovation. Students explore STEM careers as they participate in a project-based learning process, designed to challenge and engage the natural curiosity and imagination of middle school students. Teams may design and test their ideas using modeling, automation, robotics, mechanical and computer control systems.

8th Grade Courses – Year Long

Honors Algebra 1 - (high school credit – 1 credit)

In this course, students use an inquiry-based curriculum in order to closely examine a variety of functions, with a focus on linear, quadratic, and exponential relationships. They will study and practice various methods for modeling and solving problems, as well as analyze univariate and bivariate data in real-world contexts. There will be a continuous emphasis on connecting the graphical, numerical (table), and symbolic (equation) representations of each of these functions. We will use a variety of resources including *Core Connections Algebra* textbooks for select units, projects for others, IXL for skill practice, and supplemental activities from online sources such as Desmos and Skew the Script.

Math 8

This course uses the Desmos Math 8 series as the primary curriculum. Desmos provides a wonderful opportunity for students to have an interactive role in every lesson, while teachers are able to view progress and provide feedback in real time. Students are often expected to work in cooperative groups, in which discussion and discovery are encouraged. Major unit concepts include coordinate geometry (transformations), proportional and linear relationships, bivariate data analysis, functions, volume, exponents, roots, and Pythagorean Theorem.

Language Arts 8

This course will have students exploring different genres of literature such as nonfiction memoirs, graphic novels, plays, and poetry. Authors we will be looking at include Shakespeare, Hughes, Frost, and Sharon Draper. An emphasis on integration with other courses will be made by writing a formal scientific explanation, writing a poem with a focus on wellness, and creating a multimedia piece that looks at various demographics throughout history. Students will also spend time working on speaking and presentation skills through informal presentations, large and small group discussions, and a formal presentation later in the year.

Science 8

The middle school science curriculum at DRSS is called IQWST (Investigating and Questioning our World through Science and Technology--pronounced I-quest). In 8th grade science, the sequence of physics, earth science, biology and chemistry instruction builds upon students' prior knowledge and experiences in the real world, and builds understanding from unit to unit both within and across the middle school years. Students learn complex scientific ideas by engaging in practices that include working with models, constructing scientific explanations, engaging in argumentation and debate, analyzing data gathered either from students' own investigations or captured within complex datasets, and presenting ideas to peers. Science content learned through this course will include genetics and heredity, plate tectonics, and forces and motion.

Digital Design 8

Digital Design 8 will empower students to become collaborators, innovators, inventors, and explorers of coding as the language of tomorrow. Instruction topics include the fundamentals of computer systems and networks, engineering design, 3D printing, digital media, system development life cycle, HTML, and CSS taught through exciting hands-on projects including integration in cross-content projects, production of video reflections, creation of websites for a client, and enhancement of digital portfolios. In addition to technical skill development, a concentration on 21st century skills including problem solving, time management, work ethic, accountability, critical thinking, self-reflection, and effective communication

will be woven into this course. In the final stages of this course, students will formally present their portfolio to peers, faculty, and family.

US History 8

Students will investigate the history of the United States from European exploration until the Reconstruction Era. This course will feature the people, events, and ideas that shaped the United States as we know it today. Students will be engaged in the history of our country and encouraged to examine multiple perspectives through PBL, simulations, research, primary sources, debate, and much more. From taking on the role of a fur trader prior to the American Revolution to synthesizing the experiences of different groups of people during the Civil War, students will be immersed into the history of a young United States.

Middle School Wellness and Fitness

Semester Course

Middle School Wellness & Fitness is designed to motivate students to build healthy lifestyles for today and the future in all aspects of health-physical, mental/emotional, and social. The curriculum is designed to increase student knowledge & skills in a variety of adolescent health topics in order to achieve and maintain wellness. Topics to be addressed in 8th grade include substance abuse, non-communicable diseases, accidental injury, reproduction, and healthy relationships. In addition, students will regularly participate in physical activity to enhance their teamwork & problem-solving skills. During this course, students will demonstrate an improvement in their cardiovascular endurance and muscular strength/endurance through individual fitness activities, as well.

Engineering Design

Semester course

Throughout the semester, students will plan and implement engineering solutions through the process of: design and build a solution, evaluate and determine effective design features within a design, redesign a solution, and explain reasons for design decisions. Students will acquire knowledge and skills in problem solving, teamwork, and innovation as they explore engineering fields. These skills will be introduced and practiced throughout the course.

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