

**U.S. Department of Education**  
**2019 National Blue Ribbon Schools Program**

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[X] Public or [ ] Non-public

For Public Schools only: (Check all that apply) [ ] Title I [ ] Charter [ ] Magnet [X] Choice

Name of Principal Mr. Andrew Sears

(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

Official School Name Dayton Regional STEM School

(As it should appear in the official records)

School Mailing Address 1724 Woodman Drive

(If address is P.O. Box, also include street address.)

Kettering OH 45420-3662  
City State Zip Code+4 (9 digits total)

County Montgomery

Telephone (937) 256-3777

Fax (937) 256-7655

Web site/URL https://www.daytonstemschool.org

E-mail info@daytonstemschool.org

I have reviewed the information in this application, including the eligibility requirements on page 2 (Part I-Eligibility Certification), and certify, to the best of my knowledge, that it is accurate.

Date \_\_\_\_\_  
\_\_\_\_\_  
(Principal's Signature)

Name of Superintendent\*Mrs. Robin Fisher

(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

E-mail

Robin.fisher@daytonstemschool.org

District Name Dayton Regional STEM School District Tel. (937) 256-3777

I have reviewed the information in this application, including the eligibility requirements on page 2 (Part I-Eligibility Certification), and certify, to the best of my knowledge, that it is accurate.

Date \_\_\_\_\_  
\_\_\_\_\_  
(Superintendent's Signature)

Name of School Board

President/Chairperson Dr. David Goldstein

(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

I have reviewed the information in this application, including the eligibility requirements on page 2 (Part I-Eligibility Certification), and certify, to the best of my knowledge, that it is accurate.

Date \_\_\_\_\_  
\_\_\_\_\_  
(School Board President's/Chairperson's Signature)

The original signed cover sheet only should be converted to a PDF file and uploaded via the online portal.

*\*Non-public Schools: If the information requested is not applicable, write N/A in the space.*

## **Part I – Eligibility Certification**

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The signatures on the first page of this application (cover page) certify that each of the statements below, concerning the school’s eligibility and compliance with U.S. Department of Education and National Blue Ribbon Schools requirements, are true and correct.

1. All nominated public schools must meet the state’s performance targets in reading (or English language arts) and mathematics and other academic indicators (i.e., attendance rate and graduation rate), for the all students group, including having participation rates of at least 95 percent using the most recent accountability results available for nomination.
2. To meet final eligibility, all nominated public schools must be certified by states prior to September 2019 in order to meet all eligibility requirements. Any status appeals must be resolved at least two weeks before the awards ceremony for the school to receive the award.
3. The school configuration includes one or more of grades K-12. Schools on the same campus with one principal, even a K-12 school, must apply as an entire school.
4. The school has been in existence for five full years, that is, from at least September 2013 and each tested grade must have been part of the school for the past three years.
5. The nominated school has not received the National Blue Ribbon Schools award in the past five years: 2014, 2015, 2016, 2017, or 2018.
6. The nominated school has no history of testing irregularities, nor have charges of irregularities been brought against the school at the time of nomination. If irregularities are later discovered and proven by the state, the U.S. Department of Education reserves the right to disqualify a school’s application and/or rescind a school’s award.
7. The nominated school has not been identified by the state as “persistently dangerous” within the last two years.
8. The nominated school or district is not refusing Office of Civil Rights (OCR) access to information necessary to investigate a civil rights complaint or to conduct a district-wide compliance review.
9. The OCR has not issued a violation letter of findings to the school district concluding that the nominated school or the district as a whole has violated one or more of the civil rights statutes. A violation letter of findings will not be considered outstanding if OCR has accepted a corrective action plan from the district to remedy the violation.
10. The U.S. Department of Justice does not have a pending suit alleging that the nominated school or the school district, as a whole, has violated one or more of the civil rights statutes or the Constitution’s equal protection clause.
11. There are no findings of violations of the Individuals with Disabilities Education Act in a U.S. Department of Education monitoring report that apply to the school or school district in question; or if there are such findings, the state or district has corrected, or agreed to correct, the findings.

## PART II - DEMOGRAPHIC DATA

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Data should be provided for the most recent school year (2018-2019) unless otherwise stated.

### DISTRICT

1. Number of schools in the district (per district designation):
- 0 Elementary schools (includes K-8)
  - 1 Middle/Junior high schools
  - 1 High schools
  - 0 K-12 schools
- 2 TOTAL

### SCHOOL (To be completed by all schools)

2. Category that best describes the area where the school is located:
- Urban or large central city
  - Suburban
  - Rural or small city/town
3. Number of students as of October 1, 2018 enrolled at each grade level or its equivalent in applying school:

Grade	# of Males	# of Females	Grade Total
PreK	0	0	0
K	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	51	60	111
7	57	52	109
8	59	49	108
9	46	49	95
10	53	39	92
11	40	39	79
12 or higher	34	33	67
<b>Total Students</b>	340	321	661

\*Schools that house PreK programs should count preschool students **only** if the school administration is responsible for the program.

4. Racial/ethnic composition of the school (if unknown, estimate):
- 0 % American Indian or Alaska Native
  - 6 % Asian
  - 9 % Black or African American
  - 3 % Hispanic or Latino
  - 0 % Native Hawaiian or Other Pacific Islander
  - 74 % White
  - 8 % Two or more races
- 100 % Total**

(Only these seven standard categories should be used to report the racial/ethnic composition of your school. The Final Guidance on Maintaining, Collecting, and Reporting Racial and Ethnic Data to the U.S. Department of Education published in the October 19, 2007 *Federal Register* provides definitions for each of the seven categories.)

5. Student turnover, or mobility rate, during the 2017 – 2018 school year: 3%

If the mobility rate is above 15%, please explain.

This rate should be calculated using the grid below. The answer to (6) is the mobility rate.

<b>Steps For Determining Mobility Rate</b>	<b>Answer</b>
(1) Number of students who transferred <i>to</i> the school after October 1, 2017 until the end of the 2017-2018 school year	0
(2) Number of students who transferred <i>from</i> the school after October 1, 2017 until the end of the 2017-2018 school year	21
(3) Total of all transferred students [sum of rows (1) and (2)]	21
(4) Total number of students in the school as of October 1, 2017	658
(5) Total transferred students in row (3) divided by total students in row (4)	0.03
(6) Amount in row (5) multiplied by 100	3

6. English Language Learners (ELL) in the school: 0%  
0 Total number ELL

Specify each non-English language represented in the school (separate languages by commas):

7. Students eligible for free/reduced-priced meals: 17%  
 Total number students who qualify: 112

8. Students receiving special education services: 5 %  
33 Total number of students served

Indicate below the number of students with disabilities according to conditions designated in the Individuals with Disabilities Education Act. Do not add additional conditions. It is possible that students may be classified in more than one condition.

- |                                  |  |
|----------------------------------|--|
| <u>5</u> Autism                  | <u>0</u> Multiple Disabilities                 |
| <u>0</u> Deafness                | <u>0</u> Orthopedic Impairment                 |
| <u>0</u> Deaf-Blindness          | <u>15</u> Other Health Impaired                |
| <u>0</u> Developmental Delay     | <u>11</u> Specific Learning Disability         |
| <u>1</u> Emotional Disturbance   | <u>1</u> Speech or Language Impairment         |
| <u>0</u> Hearing Impairment      | <u>0</u> Traumatic Brain Injury                |
| <u>0</u> Intellectual Disability | <u>0</u> Visual Impairment Including Blindness |

9. Number of years the principal has been in her/his position at this school: 2
10. Use Full-Time Equivalents (FTEs), rounded to nearest whole numeral, to indicate the number of school staff in each of the categories below:

	<b>Number of Staff</b>
Administrators	4
Classroom teachers including those teaching high school specialty subjects, e.g., third grade teacher, history teacher, algebra teacher.	30
Resource teachers/specialists/coaches e.g., reading specialist, science coach, special education teacher, technology specialist, art teacher, etc.	6
Paraprofessionals under the supervision of a professional supporting single, group, or classroom students.	1
Student support personnel e.g., school counselors, behavior interventionists, mental/physical health service providers, psychologists, family engagement liaisons, career/college attainment coaches, etc.	5

11. Average student-classroom teacher ratio, that is, the number of students in the school divided by the FTE of classroom teachers, e.g., 22:1 22:1

12. Show daily student attendance rates. Only high schools need to supply yearly graduation rates.

<b>Required Information</b>	2017-2018	2016-2017	2015-2016	2014-2015	2013-2014
Daily student attendance	98%	98%	97%	96%	96%
High school graduation rate	100%	100%	100%	100%	100%

13. **For high schools only, that is, schools ending in grade 12 or higher.**

Show percentages to indicate the post-secondary status of students who graduated in Spring 2018.

<b>Post-Secondary Status</b>	
Graduating class size	77
Enrolled in a 4-year college or university	81%
Enrolled in a community college	14%
Enrolled in career/technical training program	0%
Found employment	2%
Joined the military or other public service	3%
Other	0%

14. Indicate whether your school has previously received a National Blue Ribbon Schools award.

Yes  No

If yes, select the year in which your school received the award.

15. In a couple of sentences, provide the school’s mission or vision statement.

To prepare the next generation of innovators to lead and engage in a global economy.

16. **For public schools only**, if the school is a magnet, charter, or choice school, explain how students are chosen to attend.

Each year applications are accepted for open positions within the district. Any student who resides in the state of Ohio may apply. Students are selected through a random lottery process.

## **PART III – SUMMARY**

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Founded in 2009 by local university and industry partners, The Dayton Regional STEM School's mission is to prepare the next generation of innovators to lead and engage in a global economy. The school is part of the Ohio STEM Learning Network and was founded in response to House Bill 119, passed in 2007 to establish STEM schools and programs in Ohio. DRSS is one of only a few independent STEM schools in the state of Ohio. This independent public school of choice serves grades 6-12, with a current enrollment of 670 students from more than 35 school districts in six counties. STEM students engage in project-based learning, career exploration and real-world problem-solving with the help of professionals across the Dayton region and beyond. As DRSS celebrates 10 years of innovation and success, the school's motto inspires more than ever - The Real World Starts Here.

From their very first year at The Dayton Regional STEM School, students become part of a unique school-wide culture. As they build important STEM competencies, they are also building confidence in themselves and their abilities in these fields. Twenty-first century skills are developed through our focus on Five STEM Qualities: inquiry, creativity, collaboration, persistence, and communication. At the end of their time at DRSS, our students are ready to succeed in the real world.

At DRSS, teachers have the freedom to create relevant projects, select diverse novels, and differentiate instruction with each group of students in mind; rather than fit the students to the curriculum, we design the curriculum around the students, meeting as departments annually to vertically align our projects with national and state standards. This ensures that all standards are addressed in authentic ways.

At DRSS, students engage in real-world educational experiences through a project-based learning (PBL) model, in which students learn by doing. This forward-thinking and student-centered approach is used in all grade levels and across curriculum, increasing understanding and engagement in the classroom. PBL, combined with our focus in science, technology, engineering, and math fields, creates a vibrant learning environment for young minds to discover and inspire.

DRSS is committed to providing students with the skills necessary to thrive after graduation. This begins with the STEM Foundations courses required for all 6th, 7th, and 8th grade students. This engineering and information technology curriculum provides students with the foundational technical and soft skills to be successful at DRSS and in their futures. Our Information Technology and Engineering Pathways allow students to immerse themselves into prospective fields and even earn industry-recognized credentials before graduating.

Our college readiness and career exploration programs begin in 6th grade. Each student participates in a variety of activities to help them navigate their post-secondary path, including job shadowing, internships, and the annual College and Career Fair. Our extensive list of industry partners provides easy access and networking opportunities for students interested in any field. With a 100% graduation rate and over 70% of students pursuing a STEM major in college, the Class of 2018 demonstrates the success of these programs.

The Dayton Regional STEM School has just finished a major capital project to ensure that students can continue to receive a rich experience in a facility that reflects a commitment to STEM education. Our vision includes expanded spaces to support learning, cross-curricular collaboration, partner engagement, and a growing student body. This expansion project will allow the school to increase the student population by 20% by 2025, so that more students in the Dayton region can experience all that DRSS has to offer. This space is also the new home of the Air Force Research Lab's Gaming Research Integration for Learning Laboratory (the GRILL). The GRILL is an educational outreach program that inspires student interest in STEM through modeling and simulation software. This is the only AFEL installation in a public school in the nation, making the partnership the first of its kind.

This year, DRSS was named number one on the region's list of "Top Performing High Schools" by the Dayton Business Journal. The school was also an honoree for "Best Not-for-Profit" at the Dayton Business

Journal's 2017 Business of the Year Awards. It is clear the community is aware and excited about our student and school-wide successes.

## **PART IV – CURRICULUM AND INSTRUCTION**

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### **1. Core Curriculum:**

#### **1a. Reading/English language arts:**

In English Language Arts (ELA) students are given the opportunity to communicate with real audiences, providing an authentic reason to improve their writing and speaking skills. At each grade level, students participate in projects across content areas that integrate reading and writing. In 10th grade, students study cancer in Biology, Wellness, and ELA classes, culminating in student-produced Public Service Announcements that are shared on social media by a local health agency.

In ELA, project-based learning (PBL) gives our students voice and choice in their projects, and it offers opportunities to create multiple drafts and revisions. For example, in the 7th grade Storybook Project, a collaboration with their Wellness class, students create a narrative that includes a self-selected wellness topic, point of view and story structure. After many drafts, students digitally illustrate the storybook to teach students in grades three through five about their topic and distribute the books to local agencies.

ELA teachers also create thematic units, such as the 9th grade mock trial. Students learn to think critically and work collaboratively as they delve deeply into a mock trial transcript by looking at the case from both sides. This unit allows for community involvement with guest speakers who help students to understand various aspects of the legal system. The culminating product is that students experience the process of a court trial in the classroom.

Because of the school's focus on STEM education, all 11th grade students take Technical Reading and Writing, in which they write resumes and cover letters, research future careers, and prepare cross-curricular technical reports that address their studies in chemistry and their mathematical models in Algebra 2. In 12th grade, students can take a College Credit Plus Composition course to earn 3 hours of college credit before they graduate.

#### **1b. Mathematics:**

Math courses ask students to examine real-world problems, involving modeling or lower-level thinking, and then content is scaffolded throughout learning tasks to reach a deeper understanding and create meaningful connections. Each year, students are placed in math courses according to placement tests and grouped with like peers to encourage their success. Because all students are issued laptops, math courses often integrate technology, especially IXL, Desmos and Geogebra, to allow students to explore concepts and master content.

At the beginning of the school year, students in 8th grade Algebra I and Math 8 explore the driving question, "How can we use mathematical models to describe the 8th grade class?" Students learn about types of data, write survey questions, and explore ways of managing data, leading each student to ask a question comparing two groups of people on one numerical variable, such as Do Xbox or PlayStation players spend more time on screens? To answer their question, students create a model in Excel and discuss it using claim, evidence and reasoning. This project not only allows teachers to get to know their students at the beginning of the year, but it provides foundational data and modeling skills that students will use and build upon in future projects.

In high school, students in Algebra II/Trigonometry and Precalculus answer the driving question, "How can a mathematical equation be used to describe a rider's experience on a Ferris wheel?" Using the recent installation of a Ferris Wheel in Cincinnati as inspiration, students create a scale model of their proposed Ferris wheel, and throughout the unit on graphing trigonometry functions, learn about periodic functions. Students use their models to collect data to write their trigonometry equation. In a written proposal, students explain the proposed location of their Ferris wheel and the role of each number in their equation regarding

the rider's experience. Students walk away from this project understanding the real-life applications of trigonometric equations and graphs.

### **1c. Science:**

Using PBL in Science enables students to apply their understanding of scientific phenomena and practices in a real-world context involving multiple disciplines. Students use inquiry to discover answers to driving questions through the process of developing a final product for outside audiences. For example, students in 10th Grade Biology answer the driving question, "How can we encourage the public to reduce their risk of preventable cancers?" Students work with medical professionals, marketing specialists and a professional videographer to create a professional Public Service Announcement (PSA) to raise awareness about cancer prevention. These PSAs are shared by a local health network through social media and medical conferences.

In 8th grade, in order to better understand plate tectonics, students design, build, and explain dynamic 3-dimensional models that represent 10 tectonically active regions of the Earth. Students develop a scientific explanation to include with the final models which are donated to science classrooms around the country. This project integrates content from science, language arts, and engineering. Students have voice and choice in the location they model, the materials used, and the design of the model.

In 12th grade, students can participate in a co-taught Art & Science of Materials course, which allows them to learn about the chemical and physical properties of ceramics, metals, polymers, and composites in the Science lab. Students are then asked to creatively manipulate these materials in the Art studio. For example, students form glass from raw materials and test it for mechanical properties. Students pour molten glass from the kiln and see how a viscous liquid is cooled to a glassy phase. In the art studio students practice the art of lampworking to create decorative glass beads through heating and manipulating the molten glass with various tools and handling techniques. This gives students a chance to apply and observe first-hand the concepts they are learning in the chemistry lab.

### **1d. Social studies/history/civic learning and engagement**

From creating election guides to share with first-time voters, designing Roman Newspapers that are donated to local libraries, or using video game design technology to create virtual history museums to teach others about American history, project-based learning has been consistently implemented in order to give back to our community throughout our Social Studies curriculum, which follows the standards developed by the National Council for the Social Studies and by the State of Ohio.

In sixth grade, students develop products to be sold to the public when they study economics. Each group develops their product, creates a company name, logo, and price point, and then sells their product at our community exhibition night. The proceeds from this project are then donated to a local non-profit organization that is selected by the 6th grade class.

In high school world history, students create an artistic poster that informs the public about a 20th century conflict or genocide that students have been studying. Along with their artist statements explaining their poster and its message, these posters are displayed at the Wright State University Dunbar library, and a reception is held where students, families and partners celebrate their work and honor the experiences of those lost in conflicts and genocides of the 20th century. Our authentic and integrated approach to learning Social Studies encourages DRSS students to stay informed and to become engaged citizens in their ever-changing world.

### **1e. For secondary schools:**

Students begin their career and college exploration journeys in the 6th grade. All students participate in the online Naviance program and our annual College and Career Fair, featuring over 60 organizations from all industries. 9th and 10th grade students participate in Job Shadow Day, while upperclassmen complete a 72-hour internship in a field of interest. Students explore in-demand career fields more deeply through our

Career Pathway programs in Information Technology and Engineering, with a Healthcare path on the horizon. Exposure to these fields begins in middle school, then expands to elective courses in high school. Our career exploration program helps students to build their resumes and to make early decisions about their futures.

**1f. For schools that offer preschool for three- and four-year old students:**

**2. Other Curriculum Areas:**

Students at DRSS take a year-long art course in 9th grade, with an optional year-long course in Material Science as 12th graders. These courses offer students a range of experiences in making, responding to, and presenting artwork. Exploring and expanding students' personal voices through various media, design process thinking, and decision-making, are cornerstones of the program. Curriculum is structured to be project based, interdisciplinary, and collaborative in nature, allowing students to experience the creative process across disciplines and to recognize applications in professional and daily life. For example, in conjunction with their Engineering class, students in Art I study architecture and native bird species to design birdhouses to be donated to local nursing homes. In collaboration with ELA, Geometry and Algebra, students study a piece of art and its artist, analyze its geometric shapes, angles and functions, recreate the piece in Adobe Illustrator while maintaining some of the original shapes, angles and functions, and write poetry inspired by both pieces of art.

Students at DRSS take a year-long Wellness and Fitness course in 7th, 8th, and 10th grades, with an optional year-long elective in 11th or 12th grade. In Wellness, students study the impact of behavioral choices on the health of individuals, families, and the community through project-based and inquiry-based learning. Students advocate for their health and the health of others through cross-curricular projects supported by community partners. Students learn and demonstrate health-enhancing behaviors and work toward maintaining their personal health in all aspects of overall wellness: physical, mental/emotional and social. Twenty-first century skills including the use of industry-standard technology, critique, and revision are integral parts of the courses.

In Fitness, students participate in team and individual physical activities in order to improve their personal fitness level in all aspects of health-related fitness. Technology, including pedometers, online nutrition trackers, personal fitness trackers, and heart rate monitors, are used for students to monitor their progress throughout the courses. Team-building, problem-solving, resiliency and collaboration are emphasized in each activity. By the end of the curricular cycle, students will have developed lifelong fitness and healthy living skills and behaviors aligned with national and state standards.

Students take two years of Chinese as their foreign language in 9th and 10th grades, with an option for college credit. After two years, students can opt to take one or two years of Spanish or continue with Chinese. This curricular design meets students' various needs, interests, and levels of language skills.

The foreign languages instructional approach encompasses world-readiness standards developed by the American Council on the Teaching of Foreign Languages. We want students to apply their foreign language skills and cultural understandings to their future careers and experiences. Through project-based learning, Chinese students lead activities for a local Chinese elderly club, perform a dragon dance at the local Chinese New Year's party, and communicate with high school students in Taiwan through an online blog and video chat to learn about each other's cultures first-hand. Spanish students write letters in Spanish and send hygienic products to a mission for Mexican women who have experienced domestic violence. By participating in multilingual communities in the real world, students build language skills and cultural competence.

STEM Foundations is a daily course that students take each year in middle school to practice problem solving skills using the design process and to learn about the IT and Engineering pathways in high school. As an introduction to the IT pathway, students gain foundational knowledge of current HTML and CSS web

design standards and apply this knowledge to plan, design and develop their digital portfolio, using valid, well-formed, scalable and semantically correct HTML. As an introduction to the Engineering Pathway, students use the Engineering Design Process through various hands-on PBL projects (i.e. Arduino, instrument creation, 3D printing, etc.) and use Computational Thinking to solve problems and see relationships. Students learn and implement 21st Century Skills based on the ISTE Standards, including critique, Growth Mindset, and time management. Through these projects, students grow in their metacognition, becoming more aware of their strengths, challenges, and interests.

STEMmersion is a two-week term added to the end of our school year where all students enroll in a course of their choice. Teachers design courses based on student interest, from outdoor camping at a local state park, cross-country travels to Yosemite and Washington D.C., to crash courses in "adulting," and stop motion videos. This immersive course allows students time for bonding with peers, diving deep into information that interests them, using transferable soft skills, and stepping outside of comfort zones.

### **3. Special Populations:**

At DRSS, all students who are gifted and students with disabilities are provided services in a full-inclusion setting. Students who are struggling academically or socially go through our RTI process in order for us to determine the best way to support each individual. Students may also receive academic support through our Title 1 program for reading and math. For example, math classes with Title 1 students are co-taught by our Title 1 coordinator.

Teachers work closely with our intervention specialists and gifted specialists to provide individualized accommodations and modifications to assignments, assessments, and projects, as needed by our students. Because of our full-inclusion program, students with disabilities develop impressive self-advocacy skills that serve them beyond their enrollment at DRSS. Examples of modifications provided for projects include modified timelines for submission, intentional grouping (specific partners or working individually to reduce stressors), modified product requirements based on student needs or ideas for extension, options for extending the content in depth or breadth, or additional supports and check-ins throughout the process.

For example, during the storybook project (an integration between Language Arts and Wellness) students work in a group of two to create a storybook with a minimum of eight spreads to teach a wellness topic to a specified audience. Modifications that have been used to accommodate our students have been to do the project individually with a minimum of 4 spreads, to provide a story template to help a student create a logical story line, to pair a student who struggles with writing with a strong, supportive writer, and to provide a weekly timeline with specific check-ins and submission dates to help keep the student organized and on-task.

In the Precalculus Ferris wheel project, gifted students can extend their models to shapes other than circles. A group designed a Ferris wheel which contained mini-Ferris wheels instead of cars, which allowed them to learn about and use parametric equations to describe the complex motion of the Ferris wheel. Another student chose an elliptical shape for the Ferris wheel, and so the teacher arranged for the student to consult with a physicist when developing his trigonometric formula. Additionally, some students elected to build virtual models using game design software rather than physical models. These options for extension challenged students who grasped the context quickly to explore more complex mathematical relationships, which increased their engagement in the project.

In high school, all students may elect to enroll in Honors in math and science courses. Teachers offer tiered assessments in these classes, testing the same skill but with more complex questions for students taking the course for "honors credit." Students are also able to accelerate their placement in math courses due to their scores on our twice-annual NWEA MAP tests and with teacher recommendation, which allows students who are gifted in math to take Calculus as early as 11th grade. The school also offers College Credit Plus courses, which allow students to earn more than 30 undergraduate college credits before graduating from high school.

## PART V – SCHOOL SUPPORTS

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### 1. School Climate/Culture:

The culture of our school is one of the most commented-upon aspects of our school by families, business partners, and visitors to our school.

We strive to make our school a safe and welcoming space for all students and staff. “ACE” is our Accepting Culture for Everyone initiative that began 6 years ago to create a common language to describe our school culture. Every February the school holds an “ACE Week” where students and staff participate in school-wide activities to develop and improve our awareness of the culture of our school. Activities include discussing our 5 qualities and character attributes, brainstorming policies with students to ensure school safety and respect, and celebrating various cultures in a school-wide “Culture Fest” where students share their traditions, such as food and dance.

We utilize the Stay Safe, Speak Up safety reporting system through our school’s website to give students a safe space to share and report their concerns for school and personal safety. Our administrative team takes these reports and acts quickly to rectify all reported situations.

Student-teacher relationships are a large part of our school culture. In the classroom, teachers often meet with small groups for conferences and feedback as well as conduct whole class discussions to reflect on projects and/or teaching practices, allowing students to take part in the learning process. The school hosts grade-level socials with activities like dancing, dodge ball, video games, and crafts tables where teachers are given the opportunity to interact with students. School dances, movie theater take-overs, game and trivia nights, and movie nights are all examples of our school culture extending beyond the typical school day.

Relationships are also built during student advisory times through get-to-know-you activities, design challenges, and career exploration activities. Teachers often meet one-on-one with students to help them set goals, solve challenges and celebrate academic successes, and in high school, check in with students on the college application process.

Teacher-administrator relationships add to the positive culture of DRSS. Administrators have an open-door policy so that staff can share concerns and ask for support when needed. Weekly staff meetings allow for open communication between administrators and staff, and allow for joint planning of our goals and strategic plan. Teachers are encouraged to innovate in their classrooms and are supported in this risk-taking by administrators and students. In turn, this models for and challenges our students to take risks and discover what they are capable of accomplishing both inside and outside of the school.

### 2. Engaging Families and Community:

Community is a huge part of what makes the Dayton Regional STEM School unique. Our stakeholders come together from across the region to create a family of DRSS supporters that help this institution thrive. DRSS employs a team of staff members dedicated to the advancement of the school and growth of its community. The Community Outreach Director manages community partnerships, career exploration, and public relations for the school. The Director of Development connects with businesses, foundations, and parents to increase financial support for the school. DRSS would not be the success it is today without each of these groups and their steadfast commitment to STEM education.

Parents and families are vital members of DRSS. Parents are treated as partners who engage in their child’s education and with the larger school culture and community. One opportunity for parents to get involved with DRSS is through our STEM Parent Alliance which meets quarterly, involving open space discussions and connections with school leadership. Events throughout the year bring our DRSS families together, such as family picnics and Exhibition Nights. We even reserve a theater for new release movies that interest our students and families, allowing us to enjoy the experience together.

Community and industry partners have been integral to the school's success since its founding, with local industry and university leaders serving on our Governing Board. DRSS connects with hundreds of partners each year in many ways, from career exploration and volunteering to sponsorship and advocacy. Partners keep the school in tune with workforce needs, changing trends, and professional qualities. Our strong partnerships with local two- and four-year universities benefit staff and students at each institution. DRSS hosts pre-service teachers, professors advise and provide feedback to teachers and students on projects, and university classes visit DRSS to observe teaching and classroom management strategies in action.

Partners also bring an authenticity to the learning environment, helping education come alive. For example, our 6th grade students visit a local manufacturing company during Manufacturing Day each fall to see engineering in action. The company shuts down their facility for the day in order to show our students each step of the manufacturing process in detail. Each spring, Seniors present their academic portfolios to an audience which includes members of their future fields of study, including local physicians, engineers, technology specialists, and business leaders. In response, these partners offer invaluable advice and encouragement for each student's future. Not only do the students and the school benefit from the partners, but in turn, the partners connect with their future generation of workers.

### **3. Professional Development:**

The DRSS Training Center (TC), the professional development arm of the school, provides support to teachers in implementing PBL and other innovative instructional practices into their classrooms. The TC Coordinator serves as a PBL coach for all teachers, meeting with each teacher at least twice a year to design high-quality projects that focus on meaningful content (aligned to state and/or national standards) and to implement project-based teaching practices that will improve their students' success. This instructional support encourages teachers to be innovative without the risk of impacting their annual evaluation, as the coaching process is collegial and not evaluative. This supportive atmosphere is further developed through Project Tuning Protocols, opportunities for a teacher or team of teachers to present a potential project to their colleagues for feedback, which happen regularly at weekly staff meetings. In addition, teachers meet twice a week as grade-level teams to plan projects. As a result of these experiences, teachers at DRSS view each other as some of the best resources for improving instruction.

The TC hosts professional development experiences for visiting educators through our partnership with PBL Ohio, hosted by the Educational Service Center (ESC) of Central Ohio. These events include day-long visits that provide teachers and administrators an overview of project-based learning, subject-specific visits that show, for example, math teachers how to design engaging and content-rich projects, and the "PBL 101 Academy" which gives teachers a foundation in PBL to design a project for their classrooms. The TC hosts a Fall conference, the Innovative Teaching Summit, to highlight innovative instructional practices, attended by over 100 teachers annually, and featuring 25 breakout sessions with presenters from schools and agencies from around Ohio.

Administrators use the expertise in our building to support teachers' needs. When necessary, the administration brings in experts from our area ESC for support, which increases the capacity of administrators to focus on other important areas. For example, the staff has identified student mental health as an area for professional growth, so during professional development days and some staff meetings, experts in the field from the local National Alliance on Mental Illness (NAMI) chapter and from the Montgomery County Educational Service Center presented best practices to use with students.

Funds are available to support teachers and administrators in attending professional conferences and trainings off-site, such as Mental Health First Aid, the "Wired Differently" Seminar, the Deeper Learning Conference, and the National Council of Teachers of Mathematics (NCTM) Annual Meeting. Administrators participate in all internal PD for student mental health and for PBL. Because administrators have specific areas of responsibility (e.g. testing, Title IX, etc.), they attend internal and external PD to keep up with changes in state and national procedures and policies.

#### **4. School Leadership:**

The administrative team at the Dayton Regional STEM School consists of a superintendent and two principals. The goal of the leadership team is to create and protect a school culture that is free from outside distractions so that students can focus on their education. The administration strives to create a flat organizational structure with clear roles and responsibilities to ensure efficient daily operations. The principals oversee student behavior, school climate, and the classroom experience. The superintendent is responsible for strategic initiatives, long-range planning, community engagement and ensuring that the student experience matches the established mission and vision. The principals and the superintendent interact daily, checking in to share triumphs and challenges as they arise to make sure the educational environment is conducive to student learning and growing. In order to practice shared leadership, administrators encourage teachers to take on leadership roles in their grade level teams and content-specific cohorts, and through providing professional development to our staff and to visiting educators based on their areas of training and expertise

The leadership team has collaboratively established guiding principles that help us meet the goal of creating and protecting a school culture so that students can succeed not only in the classroom but also in their future endeavors. These guiding principles include allowing teachers to be creative in their classroom instruction, respecting and promoting diversity, developing school-wide cultural support structures, and differentiating to meet the needs of all students. Our five important qualities (persistence, inquiry, creativity, collaboration and creativity) represent key professional competencies that the school experience must foster in our students. These qualities are a focal point for administrators and teachers, as well.

The leadership structure at DRSS matches the philosophies presented in servant and authentic leadership theories. For example, credit is given to the team, as opposed to the individual or for self-promotion. School leaders have open door policies with staff and students, which models and supports open communication and collaboration between teachers and students. Administrators and teachers work together to solve problems in innovative ways. For example, decisions that will have a direct impact on the classroom are brought before the staff through an open discussion format, and feedback is often sought through routine surveys and face-to-face conversations. In all situations, the students' personal, academic and professional growth serve as the focus of our policies and practices. The administrative team sees their role as protectors of the classroom, clearing outside distractions, so that the important work of teaching takes priority in our school.

## **Part VI – STRATEGIES FOR ACADEMIC SUCCESS**

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In 2009, The Dayton Regional STEM School (DRSS) began with a focus on learning about STEM fields through integrated projects, which allowed students to explore connections across disciplines. Inspired by the work of Ron Berger and the High Tech High network of schools in San Diego, the school developed a focus on Project Based Learning (PBL), now the lead teaching method used at DRSS. In PBL, students use a driving question to explore content through real-world projects. This creates an authentic, engaging, and challenging learning environment for every student. Projects encourage students to learn content through the hands-on process of creating a final product that goes through several drafts and revisions using our unique critique process, adapted from Edward de Bono’s “6 Thinking Hats.” Additionally, teachers take time to instruct and monitor students’ development of 21st century skills, including collaboration, self-advocacy, and time-management.

Project-based learning challenges our students to take responsibility for their work ethic and time management. On any given day, a visitor to our school can observe students working diligently in small groups in classrooms or in breakout spaces around the building to create a solution to a driving question. While the teacher is present and engaged with the students, answering questions, providing feedback, or conferencing with groups, it is the students who are driving the learning.

Teachers use small and large group mini-lessons, one-on-one conferences, activities, and benchmarks to guide students through content that they can apply to their projects. Students frequently reflect—individually and as a class—on their progress. Visitors will notice students completing collaboration logs in small groups to document their own and their peers’ performance for the day, discussing as a class what is working with the project and where they need more support, and documenting project stages and reflections in their digital portfolios.

Project-based learning improves our students' critical thinking skills. While we don’t teach to or focus on state tests, our students perform above state averages on standardized assessments due to the problem-solving skills they have developed through PBL. All DRSS students share their innovative projects twice a year at a school Exhibition Night, open to families, community partners, and the general public. Also, students have shared their learning as keynote speakers at the PBL Ohio Institute (a Buck Institute for Education conference serving over 600 educators), at the 2018 National Dropout Prevention Conference and at TEDxYouth Dayton. Finally, through the outreach of our Training Center, hundreds of teachers and administrators from around the Midwest have visited our school to see PBL in action.