

# STEM

Science  
Technology  
Engineering  
Mathematics

The Academy at Morristown High School

## PROGRAM OVERVIEW

### 2023-24

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MORRIS SCHOOL DISTRICT, NJ

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[WWW.MORRISTOWNHIGHSCHOOL.ORG](http://WWW.MORRISTOWNHIGHSCHOOL.ORG)





# **THE STEM ACADEMY @ MORRISTOWN HIGH SCHOOL**

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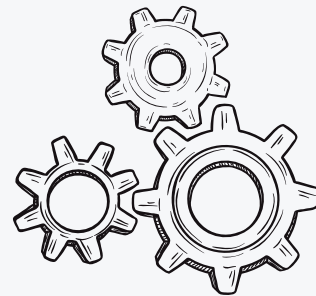
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# PROGRAM OVERVIEW



The ***Integrated STEM (Science, Technology, Engineering and Mathematics) Academy at Morristown High School*** offers a unique interdisciplinary experience for students who wish to pursue a rigorous sequence of STEM courses while engaging in a variety of other STEM-related enrichment activities. The STEM Academy offers a rich suite of courses arranged into several tracks of learning that include **Engineering, Architecture, Biomedicine, Environmental Science, Mathematics, and Computer Science**. Entering freshmen that are accepted into the STEM Academy commit to a **four-year program of study** that requires additional STEM coursework, yet is flexible enough to allow for non-STEM electives. STEM Academy students will complete all program requirements including academic coursework from their chosen track to graduate from the STEM program. STEM Academy students enter a **foundational Integrated STEM** course in ninth grade and by tenth grade, students choose a designated STEM pathway to follow. The Academy program is designed to provide students with an all-encompassing experience from academics, co-curricular programs, community service, career exploration, research and mentorships. Graduates of the STEM Academy go on to continue their work at some of the most **prestigious colleges and universities across the country**.





## PROGRAM PILLARS & CORE BELIEFS

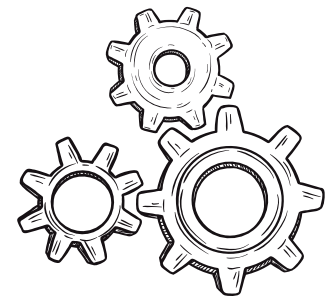
THE MHS STEM ACADEMY CONTINUES TO BUILD OFF OF **SEVEN PILLARS** THAT WERE CONSTRUCTED AND PUT IN PLACE TO SERVE AS AN EDUCATIONAL FOUNDATION FOR ALL STUDENTS. THESE COMPONENTS SERVE AS THE **CORNERSTONE OF THE MHS STEM PROGRAM** AS WELL AS STEM INSTRUCTION ACROSS THE MORRIS SCHOOL DISTRICT. THE FOUNDATIONAL ACADEMY COMPONENTS CONSIST OF:

### SEVEN PILLARS OF THE MHS STEM PROGRAM

1. *DIVERSE STEM ACADEMIC CURRICULUM*
2. *CO-CURRICULAR STEM EXTENSIONAL PROGRAMS*
3. *ACADEMY STYLE LEARNING MODELS*
4. *PROFESSIONAL FACULTY FIELD EXPERTS*
5. *FLEXIBLE & ENGAGING LEARNING ENVIRONMENTS*
6. *PROFESSIONAL CONNECTIONS & MENTORSHIPS*
7. *POST-SECONDARY AND CAREER PARTNERSHIPS*



ALONG WITH THE ORIGINAL CORE COMPONENTS A NEW AREA OF FOCUS HAS BEEN INFUSED INTO THE PROGRAM. THE CONNECTIVE FIBERS OF **DESIGN THINKING AND LIFE DESIGN** NOW SERVE AS THE CONNECTIVE BACKBONE OF LEARNING. THIS NEWLY DEVELOPED CORE PRINCIPLE SUPPORTS STUDENT PASSION AND PURPOSE THROUGH **DESIGN THINKING, RESEARCH, AND AUTHENTIC PROBLEM SOLVING.**

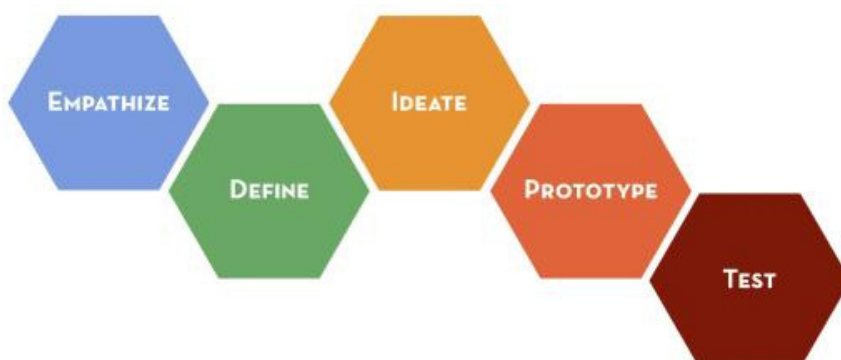


*“Design thinking is the fundamental process of applying elements from a thinker’s toolkit, such as empathy and experimentation, to arrive at innovative solutions”*

## THE LIFE DESIGN LAB

THE MORRISTOWN HIGH SCHOOL STEM ACADEMY IS ROOTED IN THE PRACTICE OF **DESIGN THINKING AND EMPATHETIC PROBLEM SOLVING**. STUDENTS HAVE THE OPPORTUNITY TO DIVE DEEP INTO INVESTIGATIVE WORK SURROUNDING DESIGN THINKING AND HUMAN-CENTERED DESIGN. LIFE DESIGN WORK PROVIDES A **UNIQUE SKILL SET OF LEARNING OPPORTUNITIES** FOR STUDENTS BY ENGAGING THEM IN A RANGE OF CRITICAL THINKING AND PROBLEM-SOLVING ACTIVITIES. STUDENTS DEFINE INDIVIDUAL PURPOSE AND PASSIONS USED TO FUEL INNOVATIVE AND COLLABORATIVE PROBLEM SOLVING. THE BASIS OF THIS WORK IS TO HELP DEFINE THE WHOLE STUDENT THROUGHOUT THEIR STEM JOURNEY. **ALL STEM ACADEMY STUDENTS ARE REQUIRED TO TAKE COURSEWORK AND PARTICIPATE IN DESIGN THINKING PROGRAMMING.**

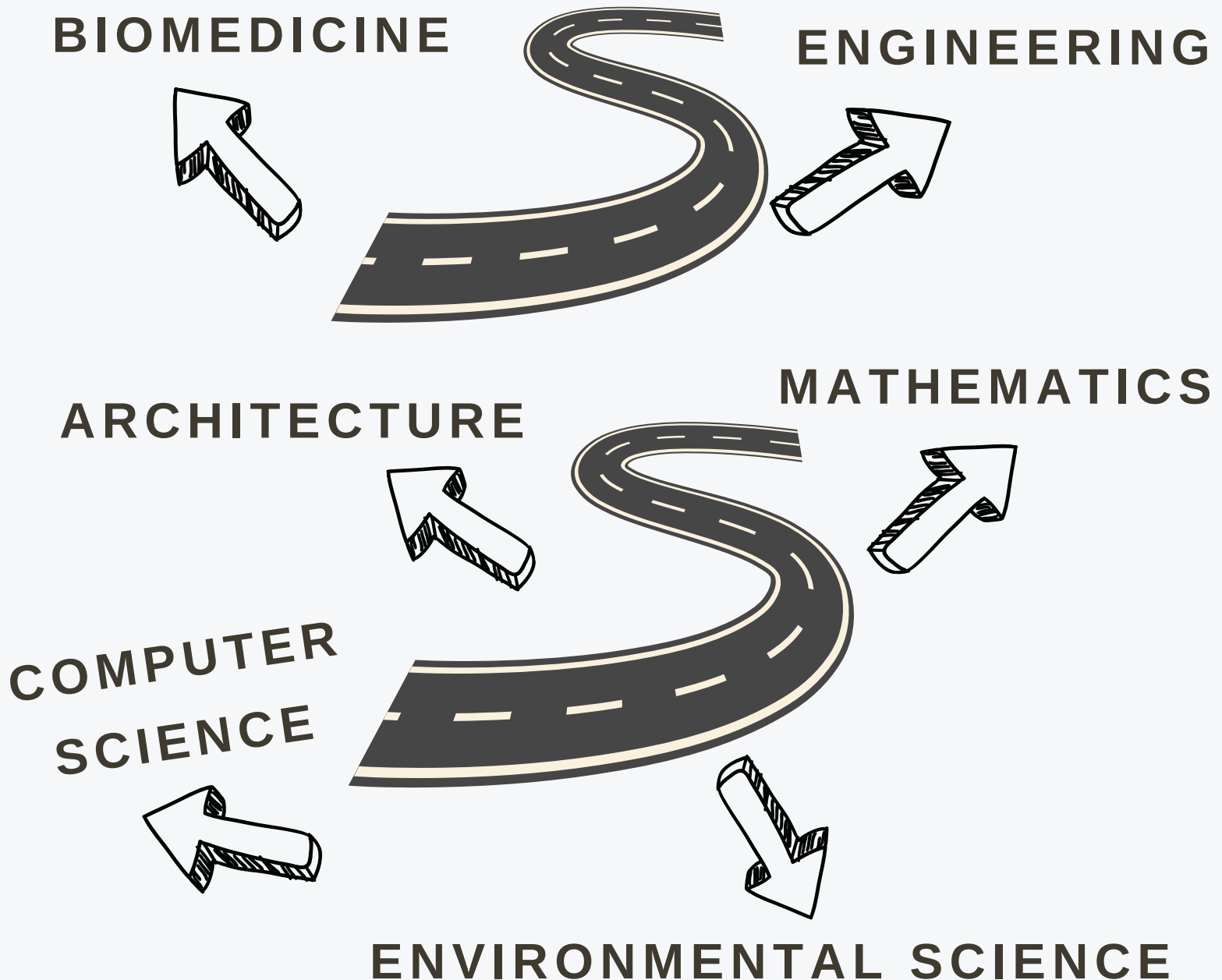
THE MORRISTOWN HIGH SCHOOL STEM ACADEMY CONTINUES TO PARTNER WITH A VARIETY OF PROGRAMS IN EFFORTS TO BRING DESIGN THINKING EXPERIENCES TO ALL STUDENTS. THESE EVENTS ARE HIGHLIGHTED BY COLLABORATIONS BETWEEN MHS, PRINCETON UNIVERSITY, JOHNS HOPKINS, STANFORD UNIVERSITY AND MORE.





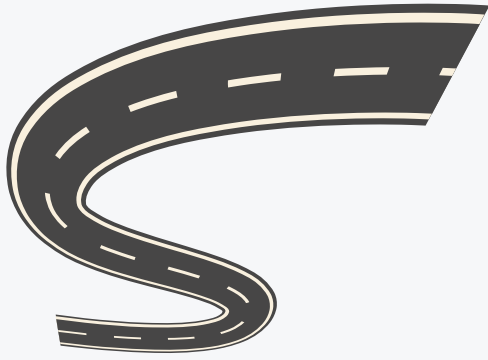
# PROGRAM PATHWAYS

STUDENTS ACCEPTED INTO THE MHS INTEGRATED STEM ACADEMY WILL ENROLL IN A FOUNDATIONAL INTEGRATED STEM COURSE AS FRESHMEN. UPON SUCCESSFUL COMPLETION OF THE COURSE, AND A RELATED CAPSTONE PROJECT, STUDENTS WILL SELECT A STEM ELECTIVE PATHWAY TO FOLLOW. COURSES FROM THEIR STEM ELECTIVE PATHWAY WILL FULL-FILL THEIR ACADEMY ACADEMIC REQUIREMENTS FOR THE NEXT THREE YEARS.



*\*NOTE: STUDENTS MAY ALSO CHOOSE A "GENERAL STEM" PATHWAY WHICH ALLOWS THEM TO FULLFILL ACADEMY ACADEMIC REQUIREMENTS BY COMPLETING ELECTIVE COURSES FROM THREE OR MORE SELECTED PATHWAYS*

# PROGRAM PATHWAY MENUS



## BIOMEDICINE

Dynamics of Healthcare® \* AP Biology  
Medical Terminology® \* AP Chemistry  
Anatomy & Physiology® \* AP Psychology  
Patient Care Communication \* AP Statistics  
Forensics \* Neuroscience

## ARCHITECTURE

CAD 1: Computer Aided Design  
CAD 2: Architectural Design(required)  
Wood Design I-IV \* Visual Art I-III  
Graphic Design I-III  
Drawing \* AP Studio Art  
CAD 3: Design Studio

## ENGINEERING

Engineering & Robotics I & II \* CAD 2: 3D CAD & Engineering  
Principles of Engineering (PTLW) \* AP Physics C  
Aerospace Engineering (PLTW) \* Nanoscale Science & Engineering  
CAD 3: Design Studio

## COMPUTER SCIENCE

Computer Science Essentials (PLTW)  
Cyber Security (PLTW)  
AP Computer Science Principles (PLTW)  
AP Computer Science A (PLTW)  
Engineering & Robotics II  
Linear Algebra PS (Post Secondary)

## MATHEMATICS

AP Calculus AB  
AP Calculus BC  
AP Statistics  
Linear Algebra  
AP Physics C: (M or E/M)  
Fundamentals of Personal Finance

## ENVIRONMENTAL SCIENCE

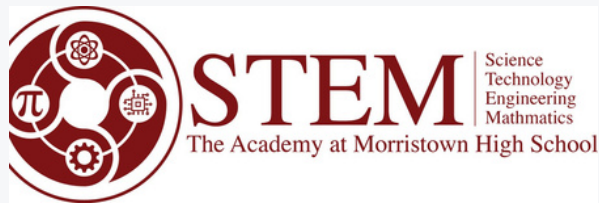
AP Environmental Science(required)  
Alternate Energy & Sustainable Design  
AP Biology  
Marine Biology  
AP Statistics  
Earth & Space Science  
Atmospheric Science

# PROGRAM REQUIREMENTS

ALL MORRISTOWN HIGH SCHOOL STEM ACADEMY STUDENTS MUST SUCCESSFULLY COMPLETE THE FOLLOWING PROGRAM REQUIREMENTS:

- COMPLETION OF YEAR 1 INTEGRATED STEM COURSE
- COMPLETION OF YEAR 1 STEM CAPSTONE PROJECT
- COMPLETION OF ANNUAL STUDENT GRADE LEVEL MEETINGS
- COMPLETION OF JUNIOR ADVISORY MEETING WITH PROGRAM COORDINATORS
- COMPLETION OF 20 ACADEMIC CREDITS IN A STEM PATHWAY
- COMPLETION OF 5 CREDITS IN DESIGN THINKING (LDL) COURSEWORK
- COMPLETION OF 40 TOTAL STEM RELATED COMMUNITY SERVICE HOURS
- COMPLETION OF 20 PROFESSIONAL CAREER PRESENTATIONS

\*REMAIN IN GOOD ACADEMIC STANDING





# CO CURRICULAR STEM EXPERIENCES

MHS STEM ACADEMY STUDENTS TAKE THEIR PASSIONS AND INTERESTS WELL BEYOND THE CLASSROOM WALLS. ACADEMY PROGRAMMING WAS DEVELOPED TO FOSTER STUDENT STEM INTERESTS OUTSIDE OF TRADITIONAL ACADEMIC COURSES AND INSTRUCTIONAL TIME. THE MHS STEM ACADEMY INCLUDES A WIDE VARIETY OF STEM CO-CURRICULAR CLUBS, PROGRAMS, COMPETITIVE TEAMS AND COMMUNITY SERVICE.



## **Technology Student Association (TSA)**

Advisor: Rodney Lee

Contact: [rodney.lee@msdk12.net](mailto:rodney.lee@msdk12.net)

## **Health Professions Club**

Advisor: Christina Doyle

Contact: [christina.doyle@msdk12.net](mailto:christina.doyle@msdk12.net)

## **Girls In STEM**

Advisor: Dr. Mariel Kolker

Contact: [mariel.kolker@msdk12.net](mailto:mariel.kolker@msdk12.net)

## **ACE Mentors Program**

Advisor: Jack Rizzo

Contact: [jack.rizzo@msdk12.net](mailto:jack.rizzo@msdk12.net)

## **Engineering Club**

Advisor: Dr. Mariel Kolker

Contact: [mariel.kolker@msdk12.net](mailto:mariel.kolker@msdk12.net)

## **National Society of Black Engineers (NSBE Jr.)**

Advisor: Rodney Lee

Contact: [rodney.lee@msdk12.net](mailto:rodney.lee@msdk12.net)

## **NJ Science League**

Advisor: Dr. Anthony Danese

Contact: [anthony.danese@msdk12.net](mailto:anthony.danese@msdk12.net)

## **Colonial Rocketry Club - TARC Rocketry Team**

Advisor: Deborah Spencer

Contact: [deborah.spencer@msdk12.net](mailto:deborah.spencer@msdk12.net)

## **Science Olympiad Team**

Advisor: Dr. Edwin Villhauer

Contact: [edwin.villhauer@msdk12.net](mailto:edwin.villhauer@msdk12.net)

## **Cyber Colonials Club**

Advisor: Dr. Mariel Kolker

Contact: [mariel.kolker@msdk12.net](mailto:mariel.kolker@msdk12.net)

## **Girls Who Code**

Advisor: Dr. Mariel Kolker

Contact: [mariel.kolker@msdk12.net](mailto:mariel.kolker@msdk12.net)

## **Robotics**

Advisor: Lauren Shohen

Contact: [lauren.shohen@msdk12.net](mailto:lauren.shohen@msdk12.net)

## **Environmental Club**

Advisor: Holly Chitundu

Contact: [holly.chitundu@msdk12.net](mailto:holly.chitundu@msdk12.net)



## PROFESSIONAL PARTNERSHIPS

Pfizer \* Novartis \* Langan \* Johnson & Johnson \* JCP&L \* Wyeth \*  
PSEG \* BASF \* Bell Labs \* Covanta \* Honeywell \* Atlantic Health \*  
Morristown Memorial Hospital \* Google \* IBM \* Microsoft \* Gilead  
Sciences \* Verizon \* Students 2 Science \* Dolan DNA Labs \* Picatinny  
Arsenal \* Liberty Science Center \* Student Global Ambassador Program  
(SGAP) \* Technology Student Association (TSA) \* ACE Mentors \* NK  
Architects \* AdvanSix \* Urban Farm of Morristown \* Grow It Green \*  
Shade Tree Commission \* Princeton Plasma Physics Lab \* Morris  
Educational Foundation \* Morris Museum \* Morris County Links \*  
National Society of Black Engineers \* Girls Who Code \* Project Lead The  
Way \* NJIT \* Princeton University \* Princeton Tiger Challenge Group \*  
Stanford d. School \* Johns Hopkins University \* Cornell University \*  
Stevens Institute of Technology \* Rutgers University \* Drew University \*  
Montclair State University \* The College of New Jersey \* NJ iSTEM  
Initiatives \* The County College of Morris \* Fairleigh Dickinson University  
\* College of St. Elizabeth \*





## ALUMNI CONNECTIONS

Bentley University \* Boston College University \* Boston University \* Bowdoin College \* Bucknell University \* Case Western Reserve University \* Colgate University \* College of St. Elizabeth \* College of William & Mary \* Columbia University \* Connecticut University \* Cornell University \* Davidson College \* Drew University \* Drexel University \* Duke University \* Emory Aeronautical University \* Fairleigh Dickinson University \* George Washington University \* Georgetown University \* Georgia Tech University \* Hartford University \* Harvard University \* Haverford College \* Indiana University \* Johns Hopkins University \* Lafayette College \* Lehigh University \* Loyola University Maryland \* Massachusetts Institute of Technology \* Montana State University \* New York University \* New Jersey Institute of Technology \* Northeastern University \* Northwestern University \* Notre Dame University \* Nova Southeastern University \* NYU \* Pennsylvania State University \* Princeton University \* Purdue University \* Rensselaer Polytechnic Institute \* Rice University \* Rowan University \* Rutgers University \* Saint Joseph's University \* Stanford University \* Stevens Institute of Technology \* Syracuse University \* The College of New Jersey \* The County College of Morris \* US Naval Academy \* UC San Diego \* UCLA \* US Air Force Academy \* University of Alabama \* University of California Berkeley \* University of Chicago \* University of Florida \* University of Georgia \* University of Illinois \* University of Maryland \* University of Miami \* University of Michigan \* University of Montana \* University of North Carolina \* University of Pittsburgh \* University of Rhode Island \* University of Richmond \* University of South Carolina \* University of Texas-Austin \* University of Vermont \* University of Virginia \* University of Wisconsin-Madison \* Villanova University \* Virginia Polytechnic Institute \* Virginia Tech University \* Wake Forest University \* West Point University \* West Virginia University \* Worcester Polytechnic Institute \* Yale University \*





## APPLICATION INFORMATION



THANK YOU FOR YOUR INTEREST IN APPLYING TO THE INTEGRATED STEM ACADEMY @ MORRISTOWN HIGH SCHOOL! THE APPLICATION PROCESS FOR THE STEM ACADEMY IS THOROUGH AND TIME SENSITIVE. ALL INTERESTED STUDENTS MUST APPLY FOR ACCEPTANCE BY FOLLOWING THE LINKS ON THE APPLICATION FORM. ALL APPLICATIONS MUST BE COMPLETED BY:

**MONDAY NOVEMBER 27TH, 2023  
(WINDOW CLOSING AT 5:00PM ON THIS DATE)**

\* ANY QUESTIONS PLEASE EMAIL THE ACADEMY DIRECTORS @:  
JANYCE TRAMPLER - [JANYCE.TRAMPLER@MSDK12.NET](mailto:JANYCE.TRAMPLER@MSDK12.NET)  
SURINA RANAWAT - [SURINA.RANAWAT@MSDK12.NET](mailto:SURINA.RANAWAT@MSDK12.NET)

\*IMPORTANT: COMPLETING THE APPLICATION REQUIRES A GOOGLE GMAIL ACCOUNT! IF YOU DO NOT HAVE A GMAIL ACCOUNT PLEASE CREATE ONE



# APPLICATION INFORMATION

## IMPORTANT DATES

MONDAY OCTOBER 2, 2023  
(ONLINE APPLICATION OPENS)

THURSDAY, OCTOBER 12, 2023  
DISCOVER MHS - 8TH GRADE OPEN HOUSE  
MORRISTOWN HIGH SCHOOL

MONDAY, OCTOBER 16, 2023  
\*VIRTUAL INFORMATION MEETING WITH STEM DIRECTORS  
\*OPEN TO PARENTS AND STUDENTS

\*PLEASE NOTE THIS MEETING IS OPTIONAL. THERE WILL BE A VIDEO RECORDING AVAILABLE AFTER THE MEETING FOR THOSE WHO DID NOT ATTEND, AND THE STEM DIRECTORS ARE ALWAYS AVAILABLE TO ANSWER QUESTIONS VIA EMAIL.

MONDAY, NOVEMBER 27, 2023  
(ONLINE APPLICATION CLOSING @ 5:00PM)

FEBRUARY 2024  
(ACCEPTANCE LETTERS RELEASED)