

**Academy of Science, Technology,
and Health**

at

Worcester East Middle School

Innovation School Plan

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Innovation School Information Sheet

Proposed Innovation School Name:	Academy of Science, Technology, and Health at Worcester East Middle School
Full/Partial Conversion or New:	Partial Conversion
Proposed Address:	420 Grafton Street Worcester, MA 01604
Primary Contact Information:	Rose Dawkins
Primary Contact Phone:	(508) 799-3430
Primary Contact Fax:	(508) 799-8251
Primary Contact Email:	dawkinsr@worc.k12.ma.us

If conversion:

Existing School Name: Worcester East Middle School
Existing School Address: 420 Grafton Street
Worcester, MA 01604

Proposed Opening Year: 2012-2013

Proposed Duration of Innovation Plan: 3 years

School Year	Grade Levels	Total Student Enrollment	Total Number of Staff
First Year	7	96	6
Second Year	6-7-8	288	16
Third Year	6-7-8	288	16
At Full Enrollment	6-7-8	288	16

Will this school serve students from multiple districts? No

Innovation School Prospectus Certification Statement

Proposed Innovation School Name	Academy of Science, Technology, and Health at Worcester East Middle School
Proposed City/Town location	420 Grafton Street Worcester, MA 01604

I hereby certify that the information submitted in the prospectus is true to the best of my knowledge and belief.

Signature of Authorized Person: _____ **Date:** _____

Authorized Person Information

Name:	Rose Dawkins
Address:	420 Grafton Street Worcester, MA 01604
Phone:	(508) 799-3430
Fax:	(508) 799-8251
Email:	dawkinsr@worc.k12.ma.us

INNOVATION PLAN CERTIFICATION STATEMENT

Proposed Innovation School Name: The Academy of Science, Technology, and Health

Proposed City/Town Location: Worcester, Massachusetts

Names of innovation plan committee members (no more than 11 individuals) selected in accordance with state law:

Affiliation	Name	Vote to approve innovation plan
Lead applicant member:	Rose Dawkins	yes
Superintendent or designee:	Jeff Mulqueen	yes
School committee member or designee:	Diana Bianchiria	yes
Parent who has one or more children enrolled in the school	Aretha Kharashqah	yes
Principal employed by district	Ivonne Perez	yes
Teacher employed by district	Philip Giarusso	yes
Teacher employed by district	Fredericka Solomon	yes
Instructional Coach	Caprice Kopka	yes
Representative of Union Leadership	Leonard Zalauskas	no
Community Partner	Robert Layne	yes
Community Partner	Sandra Mayrand	yes

Executive Summary

Who we are:

Worcester East Middle School serves approximately six hundred 7th and 8th grade students from Worcester's North Quadrant. Eighty-seven percent of the students at Worcester East Middle School receive free and reduced lunch, 29% have limited English proficiency and 23% receive special education services. Seventy percent of the students at Worcester East Middle School are members of an ethnic minority and 47% speak a first language other than English.

A sustained instructional focus on active reading and written response across all content areas has been at the center of Worcester East Middle School's instructional focus. Ongoing departmental collaborations have led to alignment of curricula with the state frameworks, the development of common assessments in all core academic subjects, and increased instructional supports. As a result, the school has made significant gains in student performance in the years following its initial designation as a commonwealth priority school in 2005. The percentage of students demonstrating proficiency on the Massachusetts Comprehensive Assessment System (MCAS) has increased 22% in English Language Arts, 13% in mathematics and 14% in science.

Where we've been:

Over ten years ago, Worcester East Middle School housed a health science academy within the school. Supported through a partnership with the Worcester Pipeline Collaborative, a division of the University of Massachusetts Medical School, the Pipeline Collaborative's mission is to encourage, educate, and challenge minority and/or economically disadvantaged students for success in the biotechnology, biomedical research, and healthcare professions where they are traditionally under-represented. The Health Science Academy at Worcester East Middle School provided students with unique opportunities including mentoring, job-shadowing, tutoring, field trips, laboratory opportunities, after-school science programs, and visiting scientist programs. Students interested in pursuing health science careers were able to begin preparation at Worcester East Middle School before entering the Health Science Academy at North High School. Over the years, as funding became tighter, various aspects of the health science program were discontinued leading to the eventual dissolution of the program.

Through the following years we created new opportunities in science, technology, and health for our students. These have included partnerships with the University of Massachusetts Medical School, Intel, EMC², Citizen School, Worcester Polytechnic Institute, Tufts University Cummings School of Veterinary Medicine, Abbott Laboratories, the Massachusetts Audubon Society, and the Massachusetts College of Pharmacy. Through these partnerships we have been able to provide students with visiting scholars, field experiences, after school mentors, scholarships, and classroom supports. Unfortunately, many of these opportunities can only accommodate a limited number of student participants, resulting in the scattering of resources

across different teams and grade levels. Although this practice ensures a degree of equity across the school, it also prevents us from consolidating a considerable series of resources into a cohesive program for students. By organizing these science, technology, and health programs under the single umbrella of a separate science academy within the parent school, we would be able to provide one-third of Worcester East Middle School students an enhanced program focused around scientific inquiry, health and technology. Most importantly, we could package these rich experiences within a rigorous curriculum designed to prepare students for advanced placement courses and a clear pathway to the Health Science Academy at North High School.

Where we're going:

The Academy of Science, Technology, and Health at Worcester East Middle School will frame student learning around the exploration of relevant projects and problems. It will provide students with the foundations for advanced literacy through application and practice in the core skills of reading, writing and communicating complex ideas and concepts to a specific audience. The integration of rigorous academics, relevant content, inquiry-based science instruction, and comprehensive supports for developing and strengthening students' literacy skills will create an environment within which students can master the multi-dimensional abilities required of them for success in college and careers. The goal of uniting student learning of specific skills, content knowledge, expertise and literacies under a common structure of inquiry, problem solving, and expression of ideas will guide the school's focus on 21st century student outcomes.

By providing superior preparation in science inquiry, the Academy of Science, Technology, and Health will present a focused track for students interested in advanced studies and careers in the sciences, health and technology. It will reestablish a clear connection creating a link between Worcester East Middle School and the Health Science Academy at North High School.

Building from Worcester East Middle School's prior practice in establishing inquiry-based science classrooms and mentoring students through independent projects, the Academy will provide opportunities for public exhibition of student work. The intention is to facilitate positive interaction between the north quadrant's middle school building and its stakeholders. By establishing opportunities to open the school for special programs and exhibitions, we will encourage and foster relationships with parents and the community promoting the school as an integral part of the surrounding neighborhood. The Academy of Science, Technology, and Health will present an additional option for middle school parents across the district to send their children to an academically rigorous program focused on college and career readiness in the sciences.

Public Statement

The Academy of Science, Technology, and Health will become an innovation school that is housed within a larger school at Worcester East Middle School. The Academy program will include 288 students in grade 6-8 at full enrollment (2013). The integration of rigorous academics, inquiry-based science instruction, and applied learning laboratories for developing and strengthening students' science, math, and literacy skills will create an environment within which students can master the multi-dimensional abilities required of them for success in college and careers. The goal of uniting student learning under the domains of scientific method and experimentation, data and statistical analysis, technology and engineering, and research and informational writing will guide the school's focus on 21st century student outcomes.

I. Mission, Vision, Statement of Need

A. Mission Statement

The Academy of Science, Technology, and Health will prepare students who seek a rigorous academic program for college and career success grounded in the sciences. Twenty-first century skills will be embedded in the context of core subjects and interdisciplinary themes that will challenge students. Applied learning opportunities will encourage engagement in real-world problems and solutions. Inquiry and problem-based approaches to instruction will enable students to recognize interests and opportunities beyond the walls of the classroom.

B. Vision Statement

The Academy of Science, Technology, and Health will integrate independent research, experimental methodology, mathematic analysis, and engineering design projects into the core of the middle school curriculum. By providing students with the tools to develop and apply content knowledge and literacy skills to exhibition of their work, students will enter high school with the academic foundation and expressive skills necessary for higher level coursework, advanced placement readiness, and preparation for college.

B. Statement of Need

Improving Student Performance Outcomes

Although Worcester East Middle School's focus on learning and sustained attention to reading and writing across the curriculum have yielded significant improvements in student performance over the last 5 years, our accomplishments still fall short of our goals. Using the Department of Elementary and Secondary Education's self-assessment tool outlining conditions for school effectiveness, we have pinpointed inconsistencies in the development of curriculum, delivery of instruction, and effective use of assessment that limit student success. The innovations proposed in this document are necessary to improve school and student performance.

The proposed Academy of Science, Technology, and Health will be inclusive of all students. The student demographics will reflect the population of Worcester East Middle School. English language learners, students with special needs and all of our identified subgroups will have the opportunity to participate in our innovation school.

The Academy of Science, Technology, and Health will provide an instructional model that improves student outcomes through the integration of classroom instruction focused on challenging work designed to build students' critical reasoning and expressive skills. Daily assessment of student work will be used to individualize support for all students. To further challenge students the innovation school will design curriculum to accommodate application of skills and knowledge to independent student projects.

The implementation of the new Massachusetts State Frameworks require schools to broaden instructional content to include student fluency in interpretation and analysis of content based material, as well as the development of student proficiency in reading informational text and writing. Identifying critical thinking and literacy skills as essential components of college and career readiness, the state framework seeks to embed these skills into content curriculum.

At Worcester East Middle School, we recognize from past experience, the value of developing instruction around student projects and inquiry-based classrooms that encourage students to apply literacy and numeracy skills to independent research. The creation of the Academy of Science, Technology, and Health will build on Worcester East Middle School's previous successes in inquiry-based education by focusing on the core reading, writing, critical thinking, and presentation skills essential to students' academic and career success.

At Worcester East Middle School, a focus on core instruction and attention to the school focus on reading and writing across the curriculum has yielded significant improvements in student performance. Common planning has resulted in clear instructional objectives, vertical and horizontal teaming and the development of common school-wide assessments in each core subject.

Alignment with North High School

The Health Science Academy at North High School provides students with unique opportunities for laboratory and field experiences as well as exposure to health science careers through mentoring and shadowing programs. Students interested in pursuing health science careers will be able to begin preparation at Worcester East Middle School before entering the Health Science Academy at North High School.

Addition of a Sixth Grade Cohort

The middle school standards must be directly aligned with the state curriculum frameworks. The current configuration of schools in the North quadrant places 6th grade students in one of the quadrant’s seven elementary schools, and 7th and 8th grade students attend Worcester East Middle School. This disparity between the varied approaches to implementation of the 6th grade standards at each of the seven elementary “feeder” schools and the subsequent 7th and 8th grade curriculum at the middle school building presents two significant obstacles to student achievement: incomplete vertical alignment of the middle school science curriculum and insufficient time for in-depth explorations of science framework standards.

D. Proposed Partnerships

We will continue to build and enhance partnerships with academic institutions and corporate STEM partners to provide unique opportunities in science, technology and health for our students. Through these partnerships we will provide our students with visiting scholars, field experiences, after-school mentors, scholarships, and classroom supports. It has become clear to us that by organizing these activities under a single umbrella, the Academy of Science, Technology, and Health we will be able to provide a large cohort of students with a cohesive set of opportunities and experiences and provide a clear pathway for entering the Health Science Academy at North High School. Partnerships will include:

Partner	Student Opportunity
Worcester Pipeline Collaborative Univ. of Massachusetts Medical School	Hands-On-Science Program Visiting Lecturer Series
Regional Science Resource Center Univ. of Massachusetts Medical School	Women in Science Conference Men in STEM
Intel	Visiting Engineers/ Field Trips
EMC ²	Visiting Engineers/ Field Trips
Worcester Polytechnic Institute	Project Lead the Way Camp Reach
Cummings School of Veterinary Medicine Tufts University	Adventures in Veterinary Medicine
Quinsigamond Community College	Vex Robotics
Abbott Laboratories	Operation Discovery
Massachusetts Audubon Society	Let’s GO!
Massachusetts College of Pharmacy	Student Mentoring/Tutoring

II. How Will Autonomy and Flexibility Be Used To Improve School Performance and Student Achievement?

A. Curriculum, Instruction, and Assessment

The core of our innovation plan requires the addition of a sixth grade student cohort into the middle school. The 2011 Massachusetts Curriculum Framework for English Language Arts and Literacy in History/Social Studies, Science and Technical Subjects clearly delineates K-5 standards from 6-12 standards, thereby including 6th grade as part of secondary school with the expectation that 6th grade students attain the same literacy competencies as outlined in the 6-12 anchor standards. At present, articulation of core curriculum between the middle grades is severely limited by the exclusion of sixth grade classes from the middle school buildings. The core curriculum is built around a model which assumes that all four core academic subjects are given significant instructional time for all three years. The current reality is that each of our feeder schools has its own unique science and social studies programs which vary widely in time on instruction (once a week vs. daily), models of instruction (in-class, special/enrichment or outside provider) and alignment with the frameworks. Reasonably, these programs concentrate on the K-5 grade standards because MCAS testing in science occurs in 5th and 8th grades. As a result, incoming seventh graders arrive at Worcester East Middle School with an uneven base in sixth grade science skills and content requiring the middle school to compress the entire three-year sequence into two years (7th and 8th grade) of instruction.

The result is that depth of instruction is sacrificed in order to ensure that students are exposed to the entire range of 6-8 standards prior to administration of the 8th grade MCAS. This presents a conundrum in that both the range of standards and depth of understanding and analysis are critical to student achievement and preparation for advanced studies. To ensure fidelity to the standards while still providing an academically rigorous curriculum requires that students explore concepts in depth, think logically and systematically, and make connections. Successful implementation of these instructional goals in the middle school years requires that both sufficient instructional time and vertical alignment of curricular sequence are ensured.

Curriculum Overview

The underpinning of the Academy of Science, Technology and Health's instructional philosophy is to shape students into independent, active learners who possess strong content knowledge as well as the literacy and 21st century skills necessary to prepare them for college and career. The addition of a sixth grade cohort will allow us the flexibility in scheduling to overcome the significant challenge of insufficient time to provide students with the opportunity to continuously apply learned skills to mastery. By expanding the middle school curriculum to three years, the Academy will be able to provide students with additional time for in-depth research, evaluation of sources, application of content based knowledge, use of technology, and presentation of their work. The innovation school curriculum will emphasize the link between knowledge and critical thinking using authentic literacy- reading, writing, speaking and listening- as a vehicle to interpret text, support arguments with evidence, draw conclusions, and solve complex problems. Sixth grade students will receive math instruction that will prepare all Academy students for pre-algebra in 7th grade and algebra in eighth grade. In addition, mathematics will be enriched at

each grade level by the addition of a ten week applied learning lab focusing on data analysis and statistics and encouraging students to apply mathematic reasoning to other content areas. Science instruction will benefit from students' additional year in middle school allowing time for the 6-8 grade state frameworks to be approached in depth. Application of science process skills to authentic projects will enable students to build the skill and knowledge base necessary for evaluation and synthesis of complex information. Beyond simply seeing and reporting results of experimentation, students will be able to extract meaning through analysis of their work. Similarly, by moving the sixth grade geography curriculum into the middle school, social studies teachers will be able to clearly establish links between the physical structure of Earth, the growth of civilization from human origins and early civilizations to kingdoms and empires, and human impacts on the planet. Quarterly enrichment classes will be scheduled at every grade level and will include art, music, computer technology, health, and physical education.

Central to our vision of the Academy of Science, Technology, and Health is the creation of an "applied learning lab" that supports the development and synthesis of student learning through the application of new skills to project and problem-based tasks. Student projects completed during the applied learning lab outlined below will provide students with: 1) opportunities for in-depth explorations of specific topics; 2) materials and academic supports for public exhibition and presentation of their work; 3) authentic assessment of applied knowledge and learning.

Applied Learning Lab

A daily applied learning lab block will provide time for structured extensions and enrichments to core curricula as well as providing ongoing academic support for students as they apply newly acquired skills and knowledge to their work. This block is essential to support the school's focus on building students' ability to synthesize learning through overt connections between content strands as well as across academic disciplines.

The block will be divided into four instructional segments offered at each grade level. Each quarter, the applied learning lab will focus on four topics: scientific method and experimentation, research and informational writing, data analysis and statistics, and engineering and technology. The segments will be designed to build student skills and capacity for independent work in each of the four areas of study over the 6 through 8 grade span. Using the gradual release of responsibility model, each class will begin in sixth grade with structured instructional units constructed around class-based projects. The seventh grade block will move toward an approach of guided instruction, with classroom teachers providing scaffolding and supports for student groups as they begin to synthesize knowledge and apply skills to a range of projects. Ultimately, eighth graders will be prepared to complete independent research and projects of their own design with guidance from a project advisor or mentor. This aligns with the Massachusetts Curriculum Frameworks anchor standards requiring students to read and write independently and proficiently.

- ***Scientific Method and Experimentation***

All science research is built around the scientific method- the basic skills of observing, hypothesizing, experimenting, analyzing and communicating results. This holds as true for simple, school-based research projects as it does for sophisticated laboratory protocols. Starting in grade six, the Scientific Method and Experimentation segment will build student skills in scientific research, beginning with the application of basic methodologies to classroom based activities and experiments in the sixth grade, incorporating field studies and experimental design in the seventh grade, and culminating with independent experimental research projects in grade eight. Through this coursework students will become proficient in modes of scientific inquiry, rules of evidence and ways of formulating research questions that characterize the culture of contemporary science. Student outcomes will focus on both the *products* of science and well as the *process* of science as students learn to apply content specific knowledge from core science, math and ELA classrooms to the scientific method.

- ***Informational Research, Writing and Presentation***

The research and informational writing component of the project block will focus on literacy skills specific to gathering information from a variety of sources, evaluating sources and summarizing information to identify relevant information and themes, communicating complex ideas, processes and conclusions in writing, and communicating ideas as well as presenting information through various visual media including maps, charts, tables, power points and poster boarding. The sixth through eighth grade writing standards provide a clear curriculum for literacy -gathering information, evaluating sources, paraphrasing and summarizing relevant information, and citing sources. By eighth grade student skills in informational research, writing and presentations will support independent student research and experimentation enabling the formulation of a thesis that conveys a perspective on the subject of their research and clearly communicates their findings.

- ***Data Analysis and Statistics***

Data and statistics are ever-present in today's world. The constant flow of data and statistics in the 21st century offers myriad natural connections to mathematics, and the application of numeracy skills to real-world situations. The applied learning lab on data and statistics will give students the tools that will allow them to organize and interpret data. Using actual or simulated data sets, students will learn how to apply the core statistical concepts covered in the middle school math curriculum to make sense of statistical information. The course will provide problems, provocative questions, and hands-on experiments that engage students in their own collection and analysis of data and create their own representations of data, meaningful "pictures" that capture data visually.

- ***Engineering Design and Technology***

Most Americans spend a significant amount of time interacting with technologies but few stop to consider how these products are designed, tested and redesigned using the engineering design process, the link that connects science and math with innovation. This instructional segment will engage students in design and building challenges reflecting real engineering problems and encouraging them to explore the fields of engineering and technology and how they influence our society. Engaging students in engineering skills- identifying a problem, designing a solution, testing, and improving the design- can offer a platform for applied and integrated learning in math, science, English language arts, and their application in social sciences. Expanding students' understanding of technology and engineering will broaden their exposure to careers and opportunities in STEM fields and encourage a diverse array of talented students to pursue advanced math and science coursework.

English Language Arts and Literacy

Our school-wide focus on literacy will provide all students with expanded opportunities to read and write. Following the guiding principles of effective literacy instruction, students will be supported in reading complex text independently, increasing their vocabulary, developing their thinking and communication skills, and increasing their ability to write for a range of tasks, purposes, and audiences. As the link between factual knowledge and critical thinking, authentic literacy will be prioritized as the underpinning of all academic endeavors. Instruction will center upon developing skills, attitudes, and habits of mind that will prepare students for college, career, and life in the 21st century. Reading, writing, speaking, and listening are the key to building a rich academic vocabulary and increasing knowledge about the world.

The ability to analyze and to think critically requires a solid base of factual knowledge which provides the foundation for the critical analysis of documents, processes, or experimental results; literacy skills provide the larger framework upon which information can be effectively examined and analyzed. Therefore, lessons, instructional units, and student projects in all subjects will be built around tasks that allow students to intellectually engage with the content they are learning, provide experience with authentic sources, and require students to apply advanced literacy and thinking skills to their work.

Mathematics

Sixth grade students will receive math instruction that will prepare all Academy students for pre-algebra in 7th grade and algebra in eighth grade. Academy students will have extended opportunities to apply mathematical reasoning as they participate in project-based learning. Students will be able to explain the meaning of a problem, look for entry points to its solution, and apply mathematics to solve problems that arise as they explore their research topics during the project-based segments. They will need to reason abstractly and quantitatively and make meaning of mathematical operations through applications to tangible real-life problems. As

students become proficient in data analysis, statistics and probability these math skills will be reinforced through application to inquiry-based projects.

Science and Technology

Investigations in science and technology/engineering involve a range of skills, habits of mind, and subject matter knowledge. The science curriculum at the Academy of Science, Technology, and Health will utilize inquiry-based instruction to support the development of students' conceptual understanding, content knowledge, and scientific skills by providing curricular opportunities to learn about and understand science and technology/engineering through participatory activities including laboratory investigations, fieldwork, and design challenges. A process skills approach to science education concentrating on inferring, predicting, communicating, analyzing, measuring, synthesizing, researching, and hypothesizing will engage students in hands-on investigations that provide a structure upon which students can apply prior knowledge while building new understandings and skills. Hands-on experiences will provide purposeful activities that are consistent with the scientific method and engineering design process enabling students to construct understanding of science concepts while reinforcing the idea that *what* is known does not stand separate from *how* it is known. Instruction and assessment will include examples drawn from life science, physical science, earth and space science, and technology/engineering standards as well as the Massachusetts Curriculum Framework for Literacy in Science and Technical Subjects. The applied learning lab will further support these endeavors by providing instructional supports for developing the core skills of scientific inquiry, research, and communication. Students will also have multiple opportunities to share, present, review, and critique scientific information or findings with others.

The parent school has already begun work with the district's science liaison to map a three-year 6th, 7th and 8th grade integrated science curriculum that aligns with both the state framework and district goals. Laboratory investigations, classroom activities, field experiences and literacy connections will be identified or developed for each instructional unit. Upon the addition of the sixth grade cohort in the second year of implementation, the Academy of Science, Technology, and Health will replace the current two-year scope and sequence with the three year curriculum. A preliminary map of the 3 year curriculum and associated labs, activities, and enhancements can be found in the attachments section at the end of this document (see appendix).

History and Social Science

The social studies curriculum requires students to examine the ways in which history, geography, and current events intertwine and provide a fundamental understanding of how the Earth's structure has impacted the development of human society. Students trace man's progress across time from simple hunter-gatherer communities to more complex and advanced civilizations, kingdoms, and Imperial empires. They use this historical foundation to make relevant and concrete connections to today's issues and global events as well as to other academic disciplines.

By adding a sixth grade to the Academy, social studies teachers will have the opportunity to fully establish the necessary understanding of basic geographical principles and their relationship to the study of human history. In addition, teachers will be able to spread instruction across three years, which will allow for a more in-depth and detailed study of each of the major areas and topics defined by the Massachusetts State Frameworks and common core standards.

Enrichments

Academy students will participate in daily enrichment classes. Each student will be scheduled for four enrichment courses each year to include, art, music, computer technology, physical education and health. Providing students with enrichment experiences will address the development of the whole child.

Social/Emotional Supports

The Academy of Science, Technology and Health will implement the *Origins Developmental Designs* model of comprehensive practices which integrate social and academic learning. Based on the premise that student success relies on a blend of good relationships, social skills, and engagement with learning each morning will begin with a seventeen minute homeroom meeting using the *Developmental Designs* approach. *Developmental Designs* structures are designed to meet adolescents' needs for autonomy, competence and relationships. *Developmental Designs* will create inclusive learning communities which allow students to feel connected, heard, empowered, and safe; as a result academic engagement increases. In a *Developmental Designs* classroom, all voices are heard. Balanced participation by all students is encouraged at all social and academic learning times. Daily practices help break down cliques and eliminate bullying through emphasis on knowing and valuing all students in all classes, and through problem-solving structures.

Two staff members will attend an *Origins Developmental Design* professional development conference to develop a plan for implementation of *Developmental Designs* guiding principles and classroom practices at the Academy, and to develop avenues to provide all Academy staff with training.

Instruction

Acknowledging that improved classroom instruction guided by ongoing professional development opportunities is the prime factor in improving student achievement, professional learning communities will be at the center of instructional practice. All teachers will use the framework of *High Quality Teaching and Learning* (HQT&L) which includes three essential elements; organization of the classroom, instructional design and delivery, and student ownership of learning. The Academy of Science, Technology and Health's teachers will be involved in professional learning communities focused on school-wide instructional strategies in addition to specific Academy initiatives. Autonomy and flexibility will support scheduling opportunities for Academy teachers to work collaboratively.

A recent self-assessment of classroom instruction revealed that teacher fidelity to implementation of research-based, school-wide practices must be consistent across classrooms. In-house professional development will provide teachers continued training in research-based literacy strategies to ensure consistent implementation of structures for the continuing development of teachers' classroom practice.

Common instructional strategies based on HQT&L will guide daily classroom practice. Informal weekly classroom observations will provide teachers with continuing feedback on instruction and student learning. This will provide an ongoing platform for teachers to demonstrate and share their best practices with colleagues and present multiple, low-stakes opportunities to identify specific weaknesses and discuss strategies for improving instruction.

Common planning time will be built into the schedule to accommodate the development of professional learning communities. Teachers will collaborate within academic departments to enrich curriculum and assessment, build teaching practice, and support growth in student achievement. In addition, teachers at each grade level will collaborate across content areas to ensure that instruction in all core subjects provide meaningful and relevant connections to our students, the school and the larger community. Grade-level teams will also provide individual student support, identifying students for academic acceleration, targeted remediation, school-home connections.

Assessment

A cornerstone of the Academy of Science, Technology, and Health's vision is the assessment of student learning through public presentation of student work, research, and projects. A focus on authentic literacy within an instructional context that supports analytical thought, critical reflection and synthesis of increasingly complex concepts will enable students to build and practice 21st century skills including:

Public Exhibition

- content knowledge and expertise
- effective oral and written communication of ideas
- effective use of technology
- emphasis on deep understanding rather than shallow knowledge
- application of learning understanding across and among core subjects
- student engagement with real world data, tools, and experts
- multiple measures of mastery

Classroom Assessment

- Daily low-stakes formative assessments to check for student understanding and inform instructional approach

- Frequent quizzes assessing “chunks” of information essential to building students’ understanding of increasingly complex concepts
- Common assessments based on instructional units in each core academic discipline will provide a shared data base upon which discussions of student achievement and instructional technique can be shared

Standardized Testing

- Ongoing analysis of performance data including MCAS and MAP by individual student, sub-groups, item analysis, performance trends over time, and student growth percentiles will be utilized to inform instruction.

Aligned Grade 6 through 8 Curriculum

Adding a sixth grade student cohort to the innovation school will enable teachers to effectively align instruction with the three year sequence outlined in the state frameworks while still allowing sufficient time for in-depth studies of key curricular concepts, acceleration, remediation, cross-curricular collaboration, and opportunities for student centered extensions of the curriculum.

During the transition from elementary school to high school, student reading and writing skills necessarily shift from a focus on literature to a focus on informational text and the written communication of facts, knowledge, and ideas. An additional year in a middle school environment, which provides the rich content and context necessary for building student skills in informational text, writing and the application of skills to independent projects, will be invaluable in preparing students for upper level courses in high school and beyond.

Effective curriculum, pedagogy, and assessment support students’ development of literacy and higher order thinking across all content areas. When students have access to high quality, standards-based instruction, they are on track for college and career readiness. Autonomy in the area of curriculum, instruction and assessment will allow the Academy of Science, Technology, and Health to more effectively align its curricula with the state curriculum frameworks and MCAS performance level descriptions, by ensuring vertical alignment of the entire scope and sequence of middle school curricula as well as horizontal articulation. In addition, the Academy teachers will be able to collaborate across grade levels within disciplines and across disciplines within each grade level, further enriching implementation of curricula. The school’s mission will focus on providing *all* students the supports necessary for high achievement and independent thinking. Our vision centers on the district’s high priority goal of student attainment of college and career readiness by creating a rich learning environment that allows students to apply their skills and knowledge to presentation of independent work.

B. Schedule and Calendar

The school's schedule and calendar support an effective three tiered instructional model. When students have access to high quality tiered instruction, learning is accelerated for every student. The school's schedule will be organized around common planning time for collaboration between grade level teams as well as departmental professional learning communities. Students' daily schedules will consist of four core academic classes (ELA, mathematics, science and social studies) enrichment courses, and an applied learning lab which will be used alternatively for informational research and writing, scientific method and experimentation, engineering and technology, and data analysis and statistics. The daily schedule will mirror that of the parent school which has an established protocol for embedding common planning time (CPT) into the regular school day. The Academy will mirror WEMS' rotating schedule which provides three CPT periods weekly. The innovation school will use one period for departmental collaboration in professional learning communities, one for grade level team planning time, and one for wrap-around student supports.

The innovation school calendar will follow that of the district with the addition of four evening sessions (one each quarter) for formal presentations of student work. The keystone of our family-school engagement plan is to create opportunities to welcome parents, partners and community members into the Academy of Science, Technology, and Health. Each quarter parents, partners, and the community will be invited to participate in student presentations, meet with teachers, tour our facilities, and view student work. Each academy teacher will be asked to facilitate at one of the four evening sessions in lieu of the current contractual obligation for Know Your School Night. Fifteen hours of summer professional development (three 5 hour sessions) will be provided for academy teachers pending funding for teacher stipends and materials. This professional development will be targeted to support the Academy of Science, Technology, and Health initiatives.

*The Academy of Science, Technology and Health
Sample Schedule of 7th Grade Classes*

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Group A	Pre-Algebra	ELA	Enrichment Period	Science	Applied Learning Lab	Social Studies
Group B	Social Studies	Pre-Algebra	Enrichment Period	ELA	Science	Applied Learning Lab
Group C	Science	Applied Learning Lab	Enrichment Period	Social Studies	ELA	Pre-Algebra
Group D	Applied Learning Lab	Science	Enrichment Period	Pre-Algebra	Social Studies	ELA

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Sample Team Teacher Schedule

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Math	Group A	Group B	CPT	Group C	Group D	Prep
ELA	Group B	Group C	CPT	Group D	Prep	Group A
Science	Group C	Group D	CPT	Prep	Group A	Group B
Applied Learning	Group D	Prep	CPT	Group A	Group B	Group C
Social Studies	Prep	Group A	CPT	Group B	Group C	Group D

Sample Student Schedule – Grade 7

	Monday	Tuesday	Wednesday	Thursday	Friday
7:10 – 7:24	Homeroom/ Advisory	Homeroom/ Advisory	Homeroom/ Advisory	Homeroom/ Advisory	Homeroom/ Advisory
7:27 – 8:22	1 Pre-Algebra	2 ELA	3 Enrichment	4 Science	5 Applied Learning Lab
8:25 - 9:20	2 ELA	3 Enrichment	4 Science	5 Applied Learning Lab	6 Social Studies
9:23 -10:18	3 Enrichment	4 Science	5 Applied Learning Lab	6 Social Studies	1 Pre-Algebra
10:18 – 10:45	Lunch	Lunch	Lunch	Lunch	Lunch
10:48 – 11:47	4 Science	5 Applied Learning Lab	6 Social Studies	1 Pre-Algebra	2 ELA
11:50 – 12:45	5 Applied Learning Lab	6 Social Studies	1 Pre-Algebra	2 ELA	3 Enrichment
12:47 – 1:43	6 Social Studies	1 Pre-Algebra	2 ELA	3 Enrichment	4 Science

C. Staffing Policies and Procedures

A skillful and knowledgeable teacher is required for an effective instructional core. When school-based personnel have staffing autonomy, they ensure every staff member has the capacity to meet the academic and social-emotional needs of students leading to every student's success. The Academy of Science, Technology, and Health is seeking the autonomy to recruit and retain highly effective teachers who will meet the unique professional expectations of the Academy. This autonomy includes the adoption of a hiring timeline which would ensure that faculty are recruited and trained well in advance of the beginning of the school year. Allowing for unforeseen circumstances, the expectation is that all staff for the subsequent school year will be selected and hired before the beginning of August. Worcester East Middle School teachers interested in applying to the Academy of Science, Technology, and Health will notify the principal of their interest and will receive priority. In order to work as an effective member of the Academy, all prospective teachers who are new to the building or in current bid positions will:

- Demonstrate understanding of and commitment to the mission and vision of the Academy
- Attend, present, and facilitate targeted professional development
- Embrace the Academy's professional learning communities and team based culture
- Attend the quarterly evening presentations of student work
- Have completed or be in the process of completing Category 1,2,3,& 4 trainings in English Language Learning
- Attend professional development in the strategies of *Origins Developmental Designs* and implement the approach in the classroom
- Support the coordinator and applied learning lab teacher in the design, development and presentation of student products
- Align instruction with established best practices in literacy

Instructional Leadership Team members will have the opportunity to participate in the selection process of candidates; the final decision will be made by the principal. The Worcester Public Schools framework of High Quality Teaching and Learning will be used as a reference tool in the hiring process. The autonomy over hiring policies and procedures will avoid the need for negotiation of waivers or modification to the collective bargaining agreement. New positions and open bids are subject to this process. The Academy will hire staff regardless of their current status (member of the district or not). The Academy of Science, Technology, and Health will use the Worcester Public Schools evaluation system, policies, and practices to address performance needs and issues that are incongruent with the intended outcomes.

The current staff has had the opportunity to participate in the creation of this planning document directly and indirectly. The entire faculty has had the opportunity to read, discuss and, through secret ballot, vote to accept, revise, or reject this plan.

In year one, the Academy of Science, Technology, and Health will house 96 seventh grade students. Staff requirements for the first year of implementation are four core content teachers (English language arts, math, science and social studies), one applied learning lab teacher, and a coordinator. At full implementation in year two, the proposed innovation school will house approximately 288 students on three grade-level instructional teams, (6th, 7th and 8th grades). The innovation school proposes that each Academy of Science, Technology, and Health team consist of four academic core teachers and a fifth teacher who will teach the applied learning lab. Therefore, at full enrollment fifteen teachers will be needed. The innovation school will share support staff and enrichment teachers with the parent school. Since this plan calls for the partial conversion of an existing school, staffing will prioritize the transitioning of current teachers from the parent school to the innovation school.

Working under the umbrella of the Worcester East Middle School principal, the coordinator will facilitate outreach to community partners and parents, organize project-based exhibitions, and provide the necessary student supports for academic excellence. The Coordinator's role will be to:

- Develop, maintain and expand community, academic, and professional partnerships
- Develop a communication protocol with all parents to support and ensure student academic success
- Facilitate and support implementation of all the Academy's academic initiatives
- Coordinate all aspects of student exhibitions and academic competitions
- Track and measure student academic progress using multiple data sources
- Develop a protocol to support students' academic success
- Monitor implementation of Developmental Designs
- Promote and foster the science, technology and health focus of the Academy
- Coordinate recruitment of students to the Academy of Science, Technology, and Health through parental outreach and programs with feeder schools

Student Support Services

The Academy will use its staffing autonomy to create staffing patterns and create job descriptions which best meet the academic, social/emotional and health needs of students. A coordinator's position is requested of the district. In addition to acting as a liaison between the school and the community, corporate and academic partners, the coordinator will also ensure that students' health, social and emotional needs are met. The coordinator will work with the adjustment counselor, school psychologist, school nurse, guidance counselors, and outside providers to guarantee that all necessary student supports are in place. If we are to expect children to be knowledgeable, responsible and caring and to be so despite significant obstacles we must teach social and emotional skills, attitudes and values with the same structure and attention that we devote to traditional subjects. The Academy of Science, Technology, and Health will include a social emotional component based on the Developmental Design approach.

D. Professional Development

Research posits that there is a strong connection between student achievement and effective instructional practice. Coupled with other resources such as a strong common curriculum aligned with the Massachusetts State Framework and high expectations for all students, teachers who are well prepared with strong content and pedagogical knowledge, will provide students with experiences to improve their academic achievement. Thus, all staff will be engaged in ongoing professional development throughout the school year.

Teachers will be provided with research based strategies to enhance their capacity to integrate literacy in all core disciplines. Professional development will address what we teach (common curriculum) and how we teach (pedagogy and authentic literacy). The Academy of Science, Technology, and Health teachers will have the autonomy to determine their professional development needs based on the specific aspects of their program including inquiry-based learning, reading, writing and speaking for presentations, and curriculum development of the science, health, and technology content areas. Science teachers entering the Academy of Science, Technology, and Health for the first time will receive summer professional development through the *Curious Minds Initiative* which provides schools and science teachers with the tools, expertise and resources necessary to integrate exciting inquiry activities into their existing curricula, and to guide students working on independent research. *Curious Minds* workshops on inquiry-based classrooms, project-based learning, and public presentation of student work products will help to ensure successful implementation of the Academy's focus on student-centered learning. In addition, all Academy teachers will be trained to implement the Developmental Design approach which will provide students on the middle school level with stability and predictability during a time in life marked by tumultuous emotional, physical, and cognitive change. The Academy of Science, Technology, and Health will also have the autonomy to determine professional development opportunities throughout the school year that would best support the mission and vision of the academy.

E. District Policies and Procedures

The proposed Academy of Science, Technology, and Health will have autonomy to create an inquiry-based science program while being mindful of state and federal regulations. The Academy will adhere to the Worcester Public Schools policies including but not limited to student safety, attendance, and promotion, and teacher evaluation and supervision.

Recruitment:

The Academy of Science, Technology, and Health at Worcester East Middle School will enroll its first class of 96 seventh grade students in the fall of 2012. District-wide recruitment of applicants for this class will begin as soon as the innovation school has been approved. Total enrollment for the 2012-2013 school year will be 96 seventh grade students. In the second year of operation (2013-2014) the seventh grade class will continue on to eighth grade, and two additional classes of 96 sixth graders and 96 seventh graders will be recruited bringing the total enrollment of the Academy of Science, Technology, and Health to 288 sixth, seventh and eighth grade students.

As a new school model within the quadrant and the district, active outreach and recruitment strategies will be developed to inform elementary school parents, students, teachers, guidance counselors and principals of the unique design and focus of the innovation school. Brochures and presentation materials will be created to introduce the Academy to 5th and 6th grade students, teachers and parents and presentations will be scheduled at each North quadrant feeder elementary school. In addition, brochures and student applications will be made available district-wide via distribution to elementary school guidance counselors, teachers and principals throughout the district and the Worcester Public Schools Information Center. An annual open house for parents and students will be held at Worcester East Middle School to introduce the new school, answer questions, address concerns, and facilitate the application process for students interested in attending the Academy of Science, Technology, and Health. For the second year of implementation, recruitment will include efforts to attract incoming 6th graders. An annual “sixth grader for a day” program will invite 5th grade students from feeder schools to visit the Academy to participate in activities and learn about the innovation school’s unique applied learning opportunities in the sciences.

Admissions:

Any student who resides in the Worcester Public Schools district is eligible to apply for admission to the Academy of Science, Technology, and Health. Students interested in applying to the Academy must complete an application form containing their contact information and parent/guardian signature and return it to their school principal or directly to Worcester East Middle School.

The coordinator will oversee the recruitment and admissions process. It will be the coordinator’s responsibility to connect with parents and students on admissions, academic, social and emotional issues. Every effort will be made to ensure that the demographic profile of the Academy of Science, Technology, and Health students and the performance indicators reflect that of the parent school. In the event that applications for admission exceed the number of slots available, preference will be given to students from the North quadrant elementary schools, in proportion to the size of each feeder school’s population. If there are more applicants than slots available, students will be selected by lottery.

F. Budget

The Academy of Science, Technology, and Health will operate on a cost neutral basis with regard to the district. The Academy will share the physical plant and certain building resources with its parent school, Worcester East Middle School, including: enrichment teachers, guidance counselors, adjustment counselor, ELL specialist, secretarial staff, school nurse, janitorial services, computer labs, science lab, school library and gym access, transportation and cafeteria services. The Academy of Science, Technology, and Health will seek budget autonomy with regard to per pupil allocation, the amount appropriated to be used for supplies and instructional materials. The Academy also requests that the district provide a coordinator and a grade 6 team of teachers.

III. Capacity of Applicant Group

In the recent past, one of the notable strengths of the Worcester East Middle School has been its overt connection to college and career pathways through Worcester Pipeline Collaborative/University of Massachusetts Medical School and the articulation between the Health Science Academies at both Worcester East Middle School and North High School. In addition, a focus on inquiry-based science instruction enriched the core curriculum by encouraging students to apply content skills to independent research. Through the development and presentation of projects, students were required to apply mathematical skills and critical analysis to the interpretation of experimental findings and data. Classroom and public presentations required students to create clear written reports describing their research as well as the development of oral skills necessary to present and discuss their work with peers and professionals alike. The result of this focus on inquiry, and application of skills across content areas led to the recognition of Worcester East Middle School students at Regional and State Science and Engineering Fairs and in the Future Cities Engineering Competition. The district recognized the school's accomplishments in science by presenting Worcester East Middle School with the Christa McAuliffe Award in Science for four years.

The primary authors of this plan, Rose Dawkins, Principal, Worcester East Middle School (the parent school), Fredericka Solomon, Science Department Head and Caprice Kopka, Instructional Coach, examined the autonomies and flexibilities provided by the Innovation School Legislation to create an Academy within the parent school to revitalize its Health Science Academy and support project-based learning.

The applicant, Rose Dawkins, has demonstrated capacity in leading Worcester East Middle School from a designated Commonwealth Priority School (2005), through its restructuring efforts resulting in consistent improvements in student performance. In 2011, DESE recognized Worcester East Middle School sustained high academic student performance by improving the accountability level from a 3 to a level 2 status. The mean student growth percentile in math (54) and ELA (63) place students in the high/moderate range in improvement indicating the school leadership’s capacity to close the achievement gap for all students.

IV. Timetable for Development and Establishment

The Academy of Science, Technology, and Health, submitted the prospectus on September 15, 2011 and received approval from the district to move forward. The applicant group reviewed the feedback and established an innovation plan committee comprised of the applicant (school principal), the superintendent’s designee, a school committee member, the union president, a parent with a child in the school, a principal from one of the district schools currently launching an innovation school, two teachers and the instructional coach from the conversion school, and two community partners who will design programs in collaboration with the new innovation school. Based on feedback and discussions we are in the process of creating the Innovation Plan. The Plan will be submitted to the district by February 9, 2012. On January 23, 2012 the WEMS faculty will vote on the plan to establish the required two-thirds approval. Upon faculty approval the plan will be submitted to the school committee.

Timetable for Development and Establishment of the Innovation School

September	Submitted initial prospectus to Superintendent Identification of community stakeholders Established Innovation Planning Committee
October	Initial meeting of Innovation Planning Committee Development of curriculum and applied learning labs Informed all staff regarding the Innovation Plan
November	2 nd meeting of Innovation Planning Committee Further developed curriculum, professional development and assessment Updated all WEMS staff Staff members received copies of draft plan for review and discussion
December	3 rd meeting of Innovation planning committee Developed staffing, hiring and recruitment protocols Updated all WEMS staff – question and answer period
January	Final review of Plan with all staff (Jan. 9) Final review of plan by Innovation Plan Committee Innovation Plan Committee vote on Plan (Jan. 11)

	Staff vote on Innovation Plan (Jan. 23) Staff approved Plan submitted to Superintendent
February	Presentation of Plan to School Committee
March	Recruitment of Students Distribution of Brochures Open house for prospective students and parents
April	Recruitment of Teachers Outreach to community partners
May	Scheduling of Students Develop a plan for parent engagement
June	Professional Development <i>Developmental Design</i> <i>Curious Minds</i>
July	Plan workshops for Professional Development in August Develop protocols for school opening Complete scheduling of students
August	Professional Development - Curriculum Development Developmental Designs Curious Minds Literacy Applied Learning Lab

V. Measurable Annual Goals

In order to assess the school across multiple measures and provide valuable benchmarks, the planning group proposes the following measurable annual goals:

- Student attendance will be at 95 % or higher
- One hundred percent of our students will demonstrate appropriate behavior to foster a climate that is conducive to learning and provide a safe and orderly environment. The implementation of the Developmental Design initiative will address the academic and social/emotional needs of the academy students, decreasing office referrals and suspensions.
- One hundred percent of the Academy students will be promoted at each grade level as they transition to high school.

ELA

- One hundred percent of our students will show improvement in reading comprehension and writing skills as demonstrated by the administration of MCAS. Our goal for MCAS SGP in ELA in 2013 is 65. The remaining students will show growth to the next

performance level or within their performance level. Our goal is to have 70% at proficient in ELA in 2013.

- One hundred percent of our students will show improvement in reading comprehension and writing skills as demonstrated by the administration of school wide common assessments. Our goal is that 80% of our students will demonstrate proficiency in reading and writing skills as measured by formative classroom assessments. The remaining students will be provided additional supports and monitored for progress on successive assessments.

Math

- One hundred percent of our students will show improvement in math as demonstrated by the administration of MCAS. Our goal for SGP in 2013 is 65. The remaining students will show growth within their performance level. Our goal is to have 50% or more at proficient in math in 2013.
- One hundred percent of our students will show improvement in math as demonstrated by the administration of school wide common assessments. Our goal is that 80 % of our students will demonstrate proficiency on the math skills and concepts as measured by formative class room assessments. The remaining students will be provided additional supports and monitored for progress on successive assessments.

Science

- One hundred percent of our students will show improvement in science as demonstrated by the administration of the Measurement of Academic Performance (MAP) science assessment. The MAP scores will be used to gauge yearly progress in the absence of annual MCAS testing in Science and Technology for grades 6 and 7.
- At full implementation 8th grade MCAS scores will be compared to district and state results to determine the effectiveness of inquiry-based science curriculum and instruction.
- One hundred percent of our students will show improvement in science as demonstrated by the administration of school wide common assessments. Our goal is that 80 % of our students will demonstrate proficiency on the science skills and concepts as measured by formative class room assessments. The remaining students will be provided additional supports and monitored for progress on successive assessments.

The Academy of Science, Technology, and Health's goal is to reduce the achievement gap among different underperforming subgroups including ELLs and students receiving special education services. The Academy of Science, Technology, and Health's program will offer high quality tiered instruction to support learning for all students.